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OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

VOL. 67.

1906.

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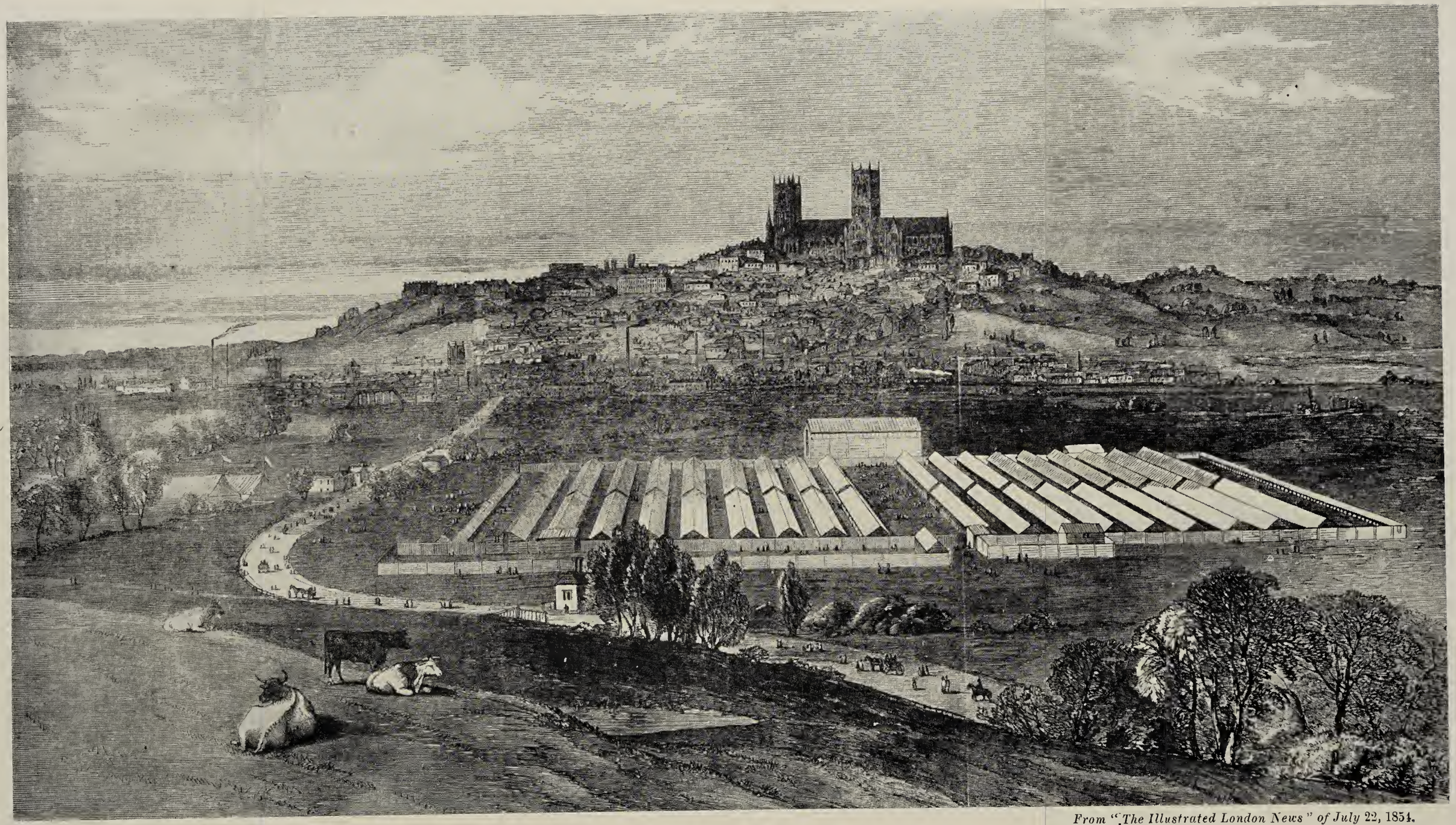

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COUNTRY MEETING OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND, LINCOLN, 1854.

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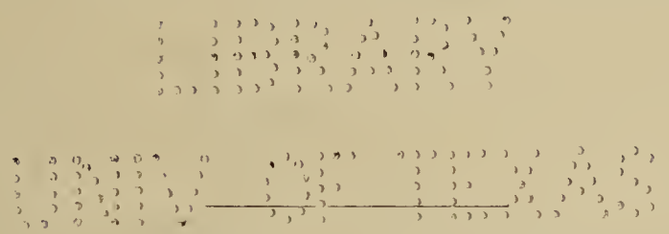

PRACTICE WITH SCIENCE.

LONDON :
JOHN MURRAY, ALBEMARLE STREET.
1906.

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(*Dating from the Foundation of the Society*):—

"The Society will not be responsible for the accuracy of the statements or conclusions contained in the several papers in the Journal, the authors themselves being solely responsible."

TABLE OF CONTENTS.

VOLUME 67, 1906.

COUNTRY MEETING OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND, LINCOLN, 1854 . *Frontispiece*

[*This picture is reproduced by photography from a contemporary woodcut, in view of the Society's approaching visit to Lincoln in* 1907.]

PAGE

The Place of the Small Holder in English Agriculture 1
By Major P. G. Craigie, C.B.

Rural Roads, with Special Reference to Modern Requirements . 20
By P. C. Cowan, B.Sc., M.Inst.C.E.

The Application of Mendel's Laws of Inheritance to Breeding Problems 46
(*With Five Illustrations and Two Diagrams*)
By R. H. Biffen, M.A.

Parasites of Cattle and Sheep. 64
(*With Fourteen Illustrations*)
By Professor John Penberthy, F.R.C.V.S.

Comparative Economy of Different Methods of Harvesting Corn Crops 98
By Professor John Wrightson.

Agricultural Weights and Measures 106
By Charles Kains-Jackson.

Impurities in Milk and Butter 118
By Ernest Mathews.

The Derby Show, 1906 127
(*With Twelve Illustrations*)
By Thomas McRow.

The Trials of Suction Gas Plants at Derby, 1906 154
(*With Twenty-five Illustrations*)
By Captain H. Riall Sankey, R.E. (ret.), M.Inst.C.E.

Miscellaneous Implements Exhibited at Derby, 1906 . . . 185
(*With Three Illustrations*)
By Bayntun Hippisley.

PAGE

Butter and Milk Tests at the Derby Show, 1906 189
By Ernest Mathews.
I.—Butter Tests 189
II.—Milk-yield Tests 193
III.—Experiments in the Dairy 198

Agricultural Education and Forestry Exhibition, 1906 . . . 201
By Ernest H. Godfrey.
I.—Agricultural Science 201
II.—Nature Study in Rural Schools 209
III.—British Forestry 211

Report of the Council to the Annual General Meeting of Governors and Members of the Society, December 12, 1906 . . . 214

Annual Report for 1906 of the Principal of the Royal Veterinary College 230
By Professor Sir John McFadyean, M.B., B.Sc., C.M.
Research Laboratory, 230 ; Anthrax, 230 ; Glanders, 231 ; Swine Fever, 232 ; Fowl Cholera, 233 ; Psorospermosis, 234 ; A new disease of cattle (*Johne's Disease*), 235.

Annual Report for 1906 of the Consulting Chemist . . . 242
By J. Augustus Voelcker, M.A., B.Sc., Ph.D.
Feeding Stuffs, 244 ; Fertilisers, 248 ; Soils, 253.

Annual Report for 1906 of the Consulting Botanist . . . 255
(*With Three Illustrations*)
By William Carruthers, F.R.S.
Purity and Germination of Seeds, 255 ; Duration of Vitality in Farm Seeds, 257 ; Buttercups in Pastures, 258 ; Diseases of Plants, 259 ; Miscellaneous, 264.

International Seed-Testing Conference at Hamburg, 1906 . . . 265
By Hans Th. Güssow.

Annual Report for 1906 of the Zoologist 267
(*With Sixteen Illustrations*)
By Cecil Warburton, M.A., F.Z.S.
The Currant Bud Moth, 268 ; Pear Midge, 271 ; Apple Trees, 272 ; Destruction of Mites by Heat, 273 ; Ticks and Disease, 274.

The Woburn Experimental Station of the Royal Agricultural Society of England 282
By J. Augustus Voelcker, M.A., B.Sc., Ph.D.
Field Experiments, 1905, 1906, 282 : Continuous Growing of Wheat, 282 ; of Barley, 288 ; Rotation Experiments, 291 ; Green-manuring Experiment, 299 ; "Head" and "Tail" Barley, 301 ; Canadian Wheat, 302 ; Soot as a top-dressing for Wheat, 304 ; Potash Manuring for Potatoes, 305 ; Nitrate of Soda and Salt for Mangels, 306 ; Experiment on late pulling of Mangels, 307 ; Lucerne, 308 ; Varieties of Lucerne, 309 ; Varieties of Clover, 309 ; Rainfall at Woburn, 310.

PAGE

Statistics affecting British Agricultural Interests 311

The Weather during the Agricultural Year, 1905-1906 . . . 333
By Frederick J. Brodie, F.R. Met. Soc.

Rainfall, Temperature, and Bright Sunshine during 1906 . . 336

The Rainfall of 1906 337

Memoranda 342

APPENDIX.

List of Council of Royal Agricultural Society of England . i

Standing Committees of the Council iii

Chief Officials of the Society iv

Distribution of Governors and Members of the Society, and of Ordinary Members of the Council v

Governors of the Society vii

Honorary Members of the Society xii

Summary of Members on Register, December 31, 1906 . . xii

Increased Annual Subscriptions and Donations xiii

Balance-sheet for 1906, with appended Statements of Ordinary Income and Expenditure and of Receipts and Expenditure at the Derby Show, 1906 xvi

Table showing the Number of Governors and Members in each Year from the Establishment of the Society . . . xxiv

Abstracts from the Proceedings of the Council in 1906 . . xxv
January 10, xxv ; February 7, xxvii ; March 7, xxix ; April 4, xxxii ; May 2, xxxiii ; May 30, xxxiii ; June 29, xxxviii ; August 1, xxxviii ; November 7, xl ; December 12, xliv.

Deputation to the Board of Agriculture, March 6, 1906 . . xxx

Proceedings at the General Meeting, June 28, 1906 . . . xxxiv

Proceedings at the Annual General Meeting, December 12, 1906 xlvi

Officials and Judges at the Derby Meeting, 1906 . . . lii

Awards of Prizes at Derby, 1906 lvi

Prize List for Lincoln Show of 1907 cxvii

Principal Regulations as to Entry Fees, &c., Lincoln Show, 1907 cxxv

Index to Volume 67 cxxvi

ERRATA.

(1) Journal, Vol. 66, 1905, at foot of page 150: "(*c*) A new food sold under a 'fancy' name." The figures given as those of the "analysis guaranteed" were not those of the food as actually sold, but were those of the guaranteed analysis of the "meal in the dry state, *i.e.*, before the cane sugar is added."

(2) *Ibid.*, page 227, lines 38 and 39: For "except in" read "including."

(3) *Ibid.*, Appendix, page lvi: Date of General Meeting in Showyard, June 28, not June 21.

Binding of the Volumes of the Journal.

GOVERNORS, MEMBERS, and others who desire to have their copies of the Journal bound in green cloth to match the Bound Volumes issued by the Society from 1901 to 1904, are requested to communicate on the subject with the Society's printers, Messrs. JAMES TRUSCOTT & SON, LTD., of Suffolk Lane, Cannon Street, London, E.C.

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„ 6. 1845 ...	„ VI. „ I. (xv.) and II. (xvi.)
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„ 8. 1847 ...	„ VIII. „ I. (xix.) and II. (xx.)
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„ 10. 1849 ...	„ X. „ I. (xxiii.) and II. (xxiv.)
„ 11. 1850 ...	„ XI. „ I. (xxv.) and II. (xxvi.)
„ 12. 1851 ...	„ XII. „ I. (xxvii.) and II. (xxviii.)
„ 13. 1852 ...	„ XIII. „ I. (xxix.) and II. (xxx.)
„ 14. 1853 ...	„ XIV. „ I. (xxxi.) and II. (xxxii.)
„ 15. 1854 ...	„ XV. „ I. (xxxiii.) and II. (xxxiv.)
„ 16. 1855 ...	„ XVI. „ I. (xxxv.) and II. (xxxvi.)
„ 17. 1856 ...	„ XVII. „ I. (xxxvii.) & II. (xxxviii.)
„ 18. 1857 ...	„ XVIII. „ I. (xxxix.) and II. (xl.)
„ 19. 1858 ...	„ XIX. „ I. (xli.) and II. (xlii.)
„ 20. 1859 ...	„ XX. „ I. (xliii.) and II. (xliv.)
„ 21. 1860 ...	„ XXI. „ I. (xlv.) and II. (xlvi.)
„ 22. 1861 ...	„ XXII. „ I. (xlvii.) and II. (xlviii.)
„ 23. 1862 ...	„ XXIII. „ I. and II. (xlix.)
„ 24. 1863 ...	„ XXIV. „ I. (l.) and II. (li.)
„ 25. 1864 ...	„ XXV. „ I. (lii.) and II. (liii.)
	SECOND SERIES
Vol. 26. 1865 ...	Vol. I. Parts I. (i.) and II. (ii.)
„ 27. 1866 ...	„ II. „ I. (iii.) and II. (iv.)
„ 28. 1867 ...	„ III. „ I. (v.) and II. (vi.)
„ 29. 1868 ...	„ IV. „ I. (vii.) and II. (viii.)
„ 30. 1869 ...	„ V. „ I. (ix.) and II. (x.)
„ 31. 1870 ...	„ VI. „ I. (xi.) and II. (xii.)
„ 32. 1871 ...	„ VII. „ I. (xiii.) and II. (xiv.)
„ 33. 1872 ...	„ VIII. „ I. (xv.) and II. (xvi.)
„ 34. 1873 ...	„ IX. „ I. (xvii.) and II. (xviii.)
„ 35. 1874 ...	„ X. „ I. (xix.) and II. (xx.)
„ 36. 1875 ...	„ XI. „ I. (xxi.) and II. (xxii.)
„ 37. 1876 ...	„ XII. „ I. (xxiii.) and II. (xxiv.)
„ 38. 1877 ...	„ XIII. „ I. (xxv.) and II. (xxvi.)

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Vol. 39. 1878 ...	Vol. XIV. Parts I. (xxvii.) and II. (xxviii.)
„ 40. 1879 ...	„ XV. „ I. (xxix.) and II. (xxx.)
„ 41. 1880 ...	„ XVI. „ I. (xxxi.) and II. (xxxii.)
„ 42. 1881 ...	„ XVII. „ I. (xxxiii.) and II. (xxxiv.)
„ 43. 1882 ...	„ XVIII. „ I. (xxxv.) and II. (xxxvi.)
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„ 52. 1891 ...	„ II. „ I. (5), II. (6), III. (7), and IV. (8)
„ 53. 1892 ...	„ III. „ I. (9), II. (10), III. (11), and IV. (12)
„ 54. 1893 ...	„ IV. „ I. (13), II. (14), III. (15), and IV. (16)
„ 55. 1894 ...	„ V. „ I. (17), II. (18), III. (19), and IV. (20)
„ 56. 1895 ...	„ VI. „ I. (21), II. (22), III. (23), and IV. (24)
„ 57. 1896 ...	„ VII. „ I. (25), II. (26), III. (27), and IV. (28)
„ 58. 1897 ...	„ VIII. „ I. (29), II. (30), III. (31), and IV. (32)
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JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY

OF ENGLAND.

THE PLACE OF THE SMALL HOLDER IN ENGLISH AGRICULTURE.

THE Royal Agricultural Society has on many occasions opened the pages of its Journal to a discussion of one phase or another of the small holdings problem. The proper and most profitable size of an area of agricultural management is a theme not unfitting for debate by practical men who can appreciate, more than either their political or theoretical advisers, the multitude of conflicting factors and conditions which prescribe and determine the most effective scope for the cultivation of the soil under the varying conditions it presents in a country like our own. A new inquiry into the feasibility of stimulating by some further measures, legislative or other, the provision of more numerous units of cultivation in England has been attracting notice, and cannot be overlooked as regards its practical side by those who can study British agriculture from the inside.

Although there is no longer a jealousy of the small holder among the most enlightened of our larger agriculturists, those who know most of the business of land management and the practice of economic production will not be carried away by the recurrent waves of sentiment or the gusts of theoretical opinion on this subject. They may nevertheless accept the dictates of what, for want of a better term, is known as political expediency, so that there is now more general agreement than was evident over a large portion of the nineteenth century that, under the agricultural conditions of the day, more room may be found for intensive farming, if the proper places and the fitting circumstances can only be secured. And

it is well this is so, for the more enthusiastic of the land reformers of the last decade of that century have received a somewhat damping account of recent efforts of legislation.

The significant facts made patent by the Parliamentary Return of 1903 respecting the net results of the Small Holdings Act of 1892 left no room for surprise at the decision of the Board of Agriculture and Fisheries to inquire anew into a subject on which the Parliamentry Committee of 1889-90 suggested legislation. The Departmental Committee which, on the nomination of Mr. Fellowes and under the Chairmanship of Lord Onslow, and with the personal co-operation of the present Minister of Agriculture in its earlier work, has been sitting since April, 1905, had naturally therefore placed in the forefront of its topics of investigation the working of the Act which made so little show in the decade covered by the published figures of holdings bought or hired under its provisions. The Committee of 1890, it may be recalled, contemplated operations on a scale which may be measured by the provision it suggested of some five millions of money for advances to facilitate the establishment of a substantial addition to the numbers of the small holders of land in Great Britain. The mere suggestion of such a sum as conceivably applicable to an agricultural purpose on this side of St. George's Channel aroused at the time no little interest. The harvest secured after ten years' working was in strong contrast to the hopes of the legislators. Of the County Councils of England only five seem to have purchased, and three others to have hired land for subdivision in small holdings, and one only of the Scottish local authorities has accomplished anything under the statute. A total of 248 acres sold to 72 peasant proprietors, allowing an average holding of three acres and a half, and a further total of 374 acres let to 166 small tenants, can have made no perceptible addition to the 400,000 small holdings officially reported before the Act was passed, or to the 4,900,000 acres of the "not exceeding fifty acre" holdings which were recorded as existent in the last decade of the nineteenth century in Great Britain.

Whether, therefore, it was the fault of the machinery provided by Parliament, or whether it was the absence of any local demand, strong enough and sound enough to make itself perceptibly felt, for the increase of holdings of this type, it was quite time that a new investigation should be made not alone into the administration and efficiency of the statute which seemed to have done so little, but more widely into the local history of what had been going on outside of legislation by voluntary or co-operative action to promote the extension of the class of small cultivators.

The results of this new inquiry are now complete, and while this Journal is not the place where it is usual or convenient to discuss the legislative proposals suggested, it is nevertheless most interesting to every practical agriculturist to observe the unanimity of opinion secured—with whatever diversity of view on the methods—as to the desirability of materially strengthening the position of British agriculture by augmenting its numerical force in the constitution of the body politic of the State. It is generally agreed to be an advantage to the nation as a whole to stimulate to a keener interest in the soil the diminishing ranks of agricultural labour, and to open to the best fitted of farm workers further avenues of promotion to the tenancy or the ownership of the land. Such a result should in theory be secured without inflicting any wrong on the occupants of larger farms. The better mixing and graduation of the classes engaged in agriculture offer opportunities of mutual help and mutual gain. Wisely carried out, in the warning of past failures, as well as in the light of exceptional successes, such an object may well enlist the sympathy and co-operation of the widespread membership of the Royal Agricultural Society. A welcome on public grounds will therefore be accorded to any really effective experiments for planting more agriculturists on the land of England.

The storehouse of information respecting existing local conditions, which the Committee's Report supplies, will be drawn on very largely in all future discussions. The mustering, in convenient shape for reference, of all the varied proposals for dealing by legislation with the matter of the inquiry, is another useful piece of work. The sidelights and illustrations from the land systems of other countries, which appear in the Appendices to the bulky Minutes of Evidence, will in their turn afford matter for reflection and study. But for the moment the attention of the agricultural public will be mainly concentrated on the definite recommendations which are offered on the authority of ten of the eleven members who served on the Committee. The fact that some of the signatories to the Report either qualify or amplify these conclusions by certain individual notes and reservations in no way lessens the importance of the general findings arrived at ; and the absence of the eleventh signature—that of Mr. Jesse Collings, who signs a separate Report—was to be expected by any one who remembers the assiduity with which the veteran champion of a peasant proprietory system prosecutes on a single line the particular remedy with which his name is so indelibly identified. His colleagues, with no disbelief in the advantages of ownership, where that is feasible under present economic and financial

conditions, prefer to make the most they can of the existing machinery, the traditional customs of British agriculture and the modes of tenure which already flourish, in order to push forward, so far as prudence will allow, small tenancies as well as small ownerships, exactly as the varying wants and conditions of different parts of the country may prescribe.

Leaving all details to an examination of the Blue Book itself it may suffice here to indicate that the Committee attack the problem committed to them on five different lines of approach, and propose to call into action three direct and two contributory agencies to achieve their end. The direct forces which it is suggested should be set in motion are the State, the County Councils, and the existing owners of land. The State, it is proposed, should act through the Board of Agriculture and Fisheries as the particular Government Department created in 1889 for the very purpose of concentrating and focussing the administrative functions formerly diffused amongst a variety of Commissions and Committees. That Board, it is suggested, should be empowered to proceed by way of direct experiment in the purchase, equipment, letting, and sale of small holdings in suitable localities. The local authorities are at the same time offered another chance with the aid of large amendments in their existing statute, which, with a wise concession to the continuity of English legislative work, is to be left to operate wherever it commends itself to the ratepayers' immediate representatives. Lastly, and perhaps as an agency more generally and immediately effective than any efforts by authorities local or central, it is suggested that the landowners of estates on which a larger supply of small farms could be usefully created should be helped and encouraged to face what the evidence collected shows to be the costly process of subdivision and equipment by the aid of State loans on favourable terms. The parallel for this proposal, which is also that of the last Royal Commission on Agriculture, is to be found half a century ago when the drainage and improvement of land was materially and most opportunely fostered, without loss to the Exchequer, by the advances of Government money which the nation found it profitable to make.

The two indirect forces which the Committee propose to call into action to promote the success of their scheme are the well-known agencies of organised co-operation and extended and improved education.

Not one of the five proposals for direct or indirect operation offers any sensational or revolutionary features. They will be generally acknowledged to present a series of sober and practical steps towards the end which is aimed at—all of them

within the limits of precedent, British or foreign, although not all of equal magnitude. Probably the new experimental efforts suggested for the Board of Agriculture will be regarded as the most novel of the group, although, as I have just indicated, the voluntary action of owners will be widely recognised as the readiest of all the forces to be summoned into action, if only Parliament will do its part in the matter and endorse the recommendations laid before it.

In a country like our own, precedent counts for much. Where to make a beginning in the large experimental enterprise suggested will be the question to be weighed. And there will be no difficulty in finding guidance on this point in the stories of witness after witness, where they tell how here, by natural process, small holdings have arisen ; how elsewhere, under irresistible economic conditions, they have decayed ; how in one place a State Board may be the effective promoting agency ; how in another an enthusiastic local authority have found the task within their powers ; and again, how owners have themselves succeeded with, occasionally, the most novel feature of the interposition of collective associations or syndicates holding and reletting small farms to qualified applicants.

My purpose in this article is not, however, to cull a series of recorded instances from the Blue Book now issued. It is rather to prepare for such consideration as the conclusions of the Committee demand by clearing out of the way some statistical misconceptions which seem to have got hold of the public mind with reference to the actual place of the small holder in the distribution of land at the present moment in this country, and the extent to which we may find already at work and in evidence examples of success and failure. There was a time not so long ago when it was customary to conclude that, whatever might be the experience of our Continental neighbours, the small holder was a non-British, or at least a non-English feature of our later agricultural practice, who required to be created, or *re*-created, as some readers of history will tell us, by the aid of the pattern and example of other lands.

The better knowledge acquired by our developed agricultural statistics has largely removed this impression, and it is now seen that however prominent may be the position of the medium and the large farmer in England, there are all around us, in particular localities and under particular climatic and market conditions, no inconsiderable number of instances where land, in nearly every county, is held and cultivated in areas not exceeding fifty acres. It may well be worth while, therefore, to examine afresh these records before any new

departure is made, and try to see what is the exact place of the small holder to-day in English agriculture, and how far it differs from that which we find elsewhere.

The latest Committee lay before us the bare facts which our agricultural returns now tell us, but, having regard to their reference, they could not be expected to discuss in any detail the statistical bearing of the figures. It would need a very exhaustive and laborious analysis of the existing statistics we possess in this country to discover what are the crops a small holder on all the soils of a country like ours, and with prices where they are, may most hopefully grow if he is to flourish and not to fail.

For such an inquiry there would have to be a new and minute local analysis of the occupiers' schedules in the lower grades of holdings, and such a search might be a long and costly business. Nevertheless it would be interesting to know something more, in extension of the 1895 returns, as to the prevalence of one or other form of agriculture in holdings under fifty acres ; the relative number on which wheat is grown ; what are the total numbers of these holdings devoted in whole or in part to potatoes, to small fruit, and so on ; and, if the figures could be got, not only for cultivated areas, but for land farmed of whatever character, what stock was raised and kept on the smaller units of our system. The returns of 1885, which preceded the 1895 investigation, were ambitious on this last point, but failed in accuracy owing to the narrowed scope of the cultivated area.

It is well known that the old category of market gardens has lost its meaning, and that special vegetable crops for sale are reared in many ordinary farms that are by no means of merely "garden" dimensions. Even much wider topics would be germane to such an inquiry : as with regard to the class of cultivator on existing small holdings, the help he gets on his holding from his own family, or the hired labour—permanent or temporary—he may still require for effective husbandry. But to do this not by merely casual type, but on a thoughtful and balanced statistical system, would probably involve an extension of our population census in an unfamiliar direction, but one that is already pursued in some of the enumerations of foreign countries.

Sometimes it has been tried to give the effect of such an investigation by quoting the experience or the balance sheets, where these exist, of individual occupiers. But the practice is not a very commendable one, and although one looks for, and may find in the evidence tendered to a Committee, instances both of successful and of unsuccessful ventures—and these deserve and receive attention—it is a dangerous practice to

generalise from casually picked out cases. It is even worse to conclude that because this or that man has succeeded, and this or that man has failed, in one particular set of circumstances or another, therefore a particular course of action may be boldly entered on ; or that an attempt should be made to regard the statements of a few individuals as typical enough to form ground for legislation rather than for the institution of further and closer experiment under varied conditions before any exaggerated demand is made on the public in any wholesale fashion for setting up in business a new series of farmers.

Nothing is more clear than what the latest Committee recognise, that the agriculture even of a relatively small country like our own is an extremely complex and varied business. What succeeds in one parish or one farm by no means necessarily succeeds in another, nor can enterprises of a special character, involving the production of a particular product, be without danger to existing cultivators multiplied at will, or attempted at all, without a very close scrutiny of the type of cultivator to be chosen and established by the public credit as a pioneer of the movement for more numerous and more intensively farmed units of cultivation. On this point apprehension is already apparent among the raspberry growers of Perthshire and the celery growers of Lincolnshire, lest a successful industry already locally established might be swamped by any ill-considered or over-done extension.

On the question of the mere number of individuals who, as a matter of fact, pursue the rôle of a small farmer, we have many figures. As a rule, in statistical comparisons between this and other countries, we usually compare the British or United Kingdom figures with those of foreign political units ; but there is a danger in the use of certain data thus combined which I am anxious for our present purpose to avoid. I use, therefore, quite designedly, the term English agriculture when I ask how the small holder bulks in proportion to larger farmers at the present time, for the conditions of Welsh, of Scottish, and still more of Irish land holders, differ rather widely from our own, and our knowledge of the relative place of the small holder in these countries is, owing to a special feature of our existing returns, less conclusive and less accurate. Only in one part of the United Kingdom—Ireland—is the basis of the holdings return the whole measured area of over 20,000,000 acres. The 594,000 separate holdings, or the 549,000 separate occupiers recorded for Ireland—for we are given choice of two sets of figures here—would work out at an average of thirty-four acres per holding or thirty-seven acres per occupier, whichever set of divisors we prefer. But these calculations cannot be properly compared with the Welsh, the Scottish, or

the English averages, all which are taken, not on total, but on cultivated land.

It is true that even in England herself the existence of *farmed* but not technically *cultivated* soil in some English counties obtains to a degree that hinders a strictly comparative statement, though this arises mainly in the group of counties constituting the northern and north-western division, where the conditions approximate to those of Wales or Scotland in this respect. Over three at least of the four agricultural divisions of England we are free from any material difficulty. For so much of the surface of England, the facts are simple. The area brought into account for the purpose of the yearly returns of the size of holdings, it must always be remembered, is only the land returned by its occupiers as cultivated, that is, carrying crops or permanent grasses. The difference between this measurement and the land farmed consists of land occupied for agricultural purposes, and used for grazing, but not regarded by the occupier as rising to the category of "permanent grass." This surface is not of course to be disregarded in its bearing on the size of the "units of farming" to which it is attached; but unfortunately it has no history, having been only recorded, and that approximately, since 1892, and the figures necessarily lack precision in certain districts where the areas are uncertain or overlap; whereas the cultivated area has been known for forty years, and can be used for comparisions of the growth or diminution of holdings between one date and another.

In the eastern, midland, and western counties of England, these rough grazings appear to form a relatively insignificant fraction of the total area, 649,000 acres, as against 17,700,000 acres cultivated; whereas in the northern division there are 1,717,000 acres of grazings attached to the cultivated area of 6,460,000 acres. In Wales there are 1,288,000 acres of grazings to 2,794,000 acres cultivated, and in Scotland, 9,104,000 acres, or nearly twice the surface used for regular crops and permanent grass, which appears as 4,863,000 acres only.

It is obvious, therefore, that the present position of the small holdings relatively to all holdings is fairly gathered by an analysis of size, made on a basis which exhaustively accounts for 96 per cent. of the farmed surface, as in the three divisions of England just above indicated. And though that basis may not be materially wrong, even when the 24,600,000 acres of cultivated land in England as a whole is referred to —forming, as it does, 91 per cent. of the surface farmed—yet it is very defective for our purpose when dealing with Wales, where the area shown as divided into holdings is only two-thirds of the farmed surface, or with Scotland, where the area so distributed is barely over one-third of that actually farmed.

Again, there is another consideration which must not be overlooked. The numbers of farmers, great and small, and the number of occupiers of land, whether on a large or on a petty scale, are not the same thing. Both sets of figures are supplied, no doubt, by the very persons themselves who ought to know what they should be called, so it is no jugglery or misstatement in a Government office which is to blame, as some imagine, for the lack of corroboration between the two classes—one drawn from the entries a householder makes as regards himself on his census schedule, and the other from what the occupier of agricultural land indicates in his yearly schedule for the Agricultural Returns.

There are in England alone, leaving out the other parts of the United Kingdom, the following discrepancies in the two sets of statistics: Farmers and graziers in 1901 in England alone appeared from the occupation column of the census as just 188,909 persons. Even if the class recorded as farm bailiffs were added to this total—and there are reasons for questioning the most recent total owing to the inclusion in this category of "foremen," who were probably not in charge of units of agricultural occupation—this would only bring up the census total to 210,000 individuals; while from the Board of Agriculture data we know the number of separate "holdings" was 380,000 at the time of the last general inquiry in 1895, and 372,000 in the returns for 1905, and the census year lay about mid-way between these dates. It follows that the occupation of something under 170,000 holdings was in the hands of persons who did not describe themselves to the census enumerator as either farmers or bailiffs; or, as is certainly true in particular instances, more holdings than one were held by a single farmer. Probably many occupiers practised other and very likely more gainful professions than farming, but there are no data available to show whether these people who held land, but were not primarily farmers, occupied large or small areas. Our own census is very deficient in this respect compared with that of some Continental countries; and it has not even continued the efforts of that reliable statistician, Dr. Farr, in continuing the Table which gave at least some approximate information respecting the staff of men engaged in the working of farms of various types.

The holdings return classifies the holdings over one acre but under five acres as 81,000 in number in England, while 167,000 more vary between five and fifty acres in extent. Probably it is among these smaller holders that a large proportion occurs of those who had placed themselves—and quite properly it may be—under some other heading than that of agriculture in filling up their census form of professions.

To what extent the small holder in England to-day is or is not a small farmer our official statistics cannot therefore enlighten us.

It is, however, not correct to allege, as is sometimes argued, that the existence of the many occupiers of land who are not primarily farmers, but who hold nevertheless, as a matter of fact, a large number of the units of cultivation, prevents our using the returns of holdings in this country as comparative data in making contrasts with the parallel returns, as regards size, of other countries. All international comparisons have difficulties of their own, but the difficulty in this respect, at all events, is not so great as it seems, for just the same thing occurs abroad as happens here, and as the latest Small Holdings Committee very properly remind us, the enumerated small holders of our Continental neighbours include many persons very largely engaged in other businesses than simple agriculture. It may be worth while to quote some examples of non-agricultural occupiers elsewhere. If we take the case of Germany, it is interesting to examine somewhat closely the very full and detailed tables of the last German occupation census, and note the extent to which occupiers of small plots of land in that country were first agriculturists and next something else, or first traders or working men and only secondarily petty farmers or residents on the land.

There are no less than 5,559,000 units of "holdings" shown in the census of 1895 in Germany, but less than half of these were occupied by agriculturists working on their own account; and even of those so working, one in every five pursued some subsidiary occupation. Industry, trade, commerce, and transport appear as commanding the principal part of the exertions—either as masters or as workmen—of not far short of two million occupiers of German land. Nor do these figures exhaust the long columns of other land occupiers, some of whom are primarily wage earners in agriculture and allied businesses, but others belong to other categories in the census. It may naturally be supposed that these cases occur most largely in the smallest sized holdings. In Germany, so small were many of the units that nearly three and a quarter millions of holdings were under five acres in extent. Now, if the professions of the petty occupiers of this grade are analysed, only about one person in six, or just 564,077 individuals, are shown as being agriculturists really working on their own account; and even of these one-fourth pursued a further and supplementary occupation, and thus did not live out of the land alone. Among the other holders of under five acre plots there were 613,596 agricultural labourers who held land as well as worked on farms. On the other hand, no less than 1,591,000 occupiers were primarily

engaged, either as chiefs or as workers, in other than agricultural industries. Nor does this altogether complete the list of all the professions of the German smaller holders.

There does not seem any good reason to expect that we should find in England any more extensive prevalence of the use of the land, as a residential adjunct or convenience only to some more directly gain-producing business, if our census authorities could be persuaded to make like inquiries into the relation between the occupation of land and the professions, primary and secondary, of the occupiers.

It may be said that Germany is, after all, a growingly industrial state, and that we should find a more exclusive use of the land as a primary source of livelihood elsewhere. Turning nevertheless to an extremely small State such as Denmark, so often quoted as an example of successful agricultural organisation, with all the aids of an excellent co-operative system, we may find, even there, something of the same disposition to regard the occupation of a small holding largely as a convenience or assistance to other than agricultural work. Out of a total of 250,000 holdings, into which nearly 9,000,000 acres of Danish soil is divided, nearly 172,000 are occupied by persons regarded as properly engaged in agriculture, with some 4,000 more engaged in somewhat kindred tasks in woodlands, gardens, and mills. The remainder, or 26 per cent. of the holdings, were in the hands of persons engaged in commerce, transport, and other industries, or held by professional, independent, and unclassified persons.

It is not therefore necessary to confine attention to the occupation of the soil in small portions to those cases where the occupation is conducted for direct subsistence or production ; and if the English small holder is not always a true farmer, but something else besides, he is no less a useful unit in the population, and he has his counterpart in other countries where the cult of the small holding has been most strenuous and most successful, and where many domestic and other rural industries, largely extirpated in our own country, survive.

Subject to these cautions it is interesting to start with a clear notion of the large aggregate of small holders which our English counties already have to show, and certain tables attached to a recent publication of the Board of Agriculture, and certain data annexed to the latest Small Holdings Committee's Report, enable this to be very conveniently done.

Briefly, out of 372,000 occupiers of purely English farms, 248,000, or exactly two in every three, are already small holders of one description or another. If we take it that a "small holding" means anything from one acre up to fifty—

which is practically the definition in the Small Holdings Act of 1892—it will be found that, so far as numbers are concerned, there is no English county in which the "fifty acre and under" occupiers of land form at the present time less than one-half of the total number of occupiers, and only nine in which these small holders are less than 60 per cent. of the total. There is one county indeed—the West Riding of Yorkshire—where there are more than three small holders to every occupier of over fifty acres. It cannot therefore be said that we have no experience to go on as to how small holders succeed or fail or what their relative position is with respect to the larger farmers around them.

I have said that just two-thirds of all the English farms shown in the returns are small holdings of one sort or another; but a closer examination of the scope of our annual returns shows that this is really an understatement of the case. These returns take no account whatever of the holdings of land below the acre limit, of which we have no recent record, whether under the loosely applied terms of allotments or gardens or plots of soil. The latest general inquiry into these still smaller units of cultivation suggested that such parcels of land already abounded between sixteen and twenty years ago, and though the classification was admittedly very defective—and there has been some indication in recent agricultural reports that the allotment demand is fully, and sometimes even more than satisfied—there is no reason to suppose there are appreciably fewer persons interested in this way in the land than formerly. All such petty cultivations find a place in the foreign tables which we most usually contrast with our less exhaustive survey.

There is such frequent misrepresentation of our English position in this respect that it is well at the outset of a new movement for increasing the number of small holdings to look into this particular consideration, which the form of our returns leads us sometimes to overlook. And here again we find it useful to compare our own conditions with those of Germany. Germany, so far as occupied by farms, covers 107,000,000 acres, and on this area displays 5,559,000 separate units or individual holdings. Of these, 58 per cent., or no less than 3,236,000, are under five acres in extent, and more than half of them are below fifty *ares* (or 1·2 acres) in extent. Yet another 36 per cent. of the German holdings lie between five acres and fifty acres; so that a total percentage of no less than 94 per cent. of the holdings of that country are of the dimensions we regard in England as "small." The parallel English figures, accounting for less than one-fourth of the German surface, show on that area a total of 372,000 separate

holdings, whereof less than 22 per cent. are under five acres, although over one acre in extent, while 45 per cent. are of the five to fifty acre class. Both together make 67 per cent. of the total against the German 94 per cent.

But any bare figures of this sort leave erroneous impressions that should be removed, unless we consent to push the comparison further, for the starting points of the two sets of statistics differ. It is essential to remember that the German returns are swollen at the lower limit by their including all fractions of petty plots, down even to some which figure in the official returns as not exceeding the *fortieth* part of an English acre. Either, therefore, we must eliminate those which fall short of the acre limit at which our regular English statistics of holdings commence, or, for want of any better estimate, we must fall back on the looser and admittedly unsatisfactory figures of the special inquiries made in this country in 1886 and 1890, and add these estimates to the later official record. In these inquiries, in one form or another, the petty parcels of land occupied as allotments and gardens, &c., were reckoned to have reached an aggregate of nearly 900,000 in round numbers for Great Britain, or nearly 800,000 if we limit the comparison to England as distinct from Scotland or from Wales. Such an estimate would raise the English holdings below fifty acres in extent to an aggregate of perhaps 1,050,000 units, against the German 5,252,000, or just one to five in place of one to eleven. If one dared therefore to add to the recorded holdings of over an acre in this country all the minor types of gardens and allotments of which we have any sort of knowledge, we should stand possessed in England of a ratio of small holdings to total holdings very much closer to that which Germany can show, or 90 against 94 per cent.

It is not a little curious that the effect of unearthing and utilising the old estimates of land held in England in plots of one acre and under one acre holdings, be they allotments or gardens or what not, and adding these to the areas with which alone our annual returns deal, exactly in what would appear to be the fashion abroad, would be so to alter the relative grouping of our statistics as to establish a claim—at all events until the old data are discarded as unreliable—to have more holdings in the very smallest category than even the Belgians, the exiguity of whose units of agricultural occupation is known to be extreme. I do not wish unduly to press this point, and no one is more conscious than I am of the difficulty of attaining certainty in our own country respecting the units of cultivation below the acre limit ; but when the case is argued against England on the ground of the small number of persons holding land in any fashion, I think the consequences of

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applying the German method of reckoning to our own conditions should be studied.

The extent to which particular portions of England have to-day a multiplicity of small holdings of all grades, and held both by owners and by tenants, necessarily crops up in the latest Committee's inquiries. Nor is it only in the recognised colonies of small farms which owe their start to more or less recent efforts that these conditions arise. I question if we shall find there a more curious instance of subdivision than that I quoted in my Statistical Society paper on the size of holdings in 1887. There, on the good authority of the late Mr. W. C. Little, I instanced a parish in the Isle of Ely of 11,000 acres, where the soil was owned by 179 owners, of whom sixty-five were stated to be farmers or gardeners, forty-one were engaged in trade or commerce, and thirty-two were labourers. There were 243 separate holdings or occupations, 47 per cent. of which were under an acre. In sixty-eight cases the properties were occupied by their owners.

It is of course on the extent of land devoted to small holdings that a more legitimate comparison may be made, and here the prevalence of allotment holding or garden culture makes a less impression on the totals. Nearly half the farmed area of Germany seems to be devoted to holdings of under fifty acres, or 44 per cent., while France does not seem to place more than 28 per cent. in farms of this size, Denmark no more than 17 per cent., and England 15 per cent.

Comparisons of the average size of holdings are often made, but on the strength of such figures as I have been commenting on above it may be well to pause before we use them to ascertain just how far down in the scale of land occupation we are prepared to go before we divide the total area by the aggregate number of units accounted for. I may be disposed to attach an undue importance to this feature of any attempt to compare the true place of the small holder in the agricultural economy of different states, but the point is one which I have repeatedly urged on the International Statistical Institute, and in the report which was laid before that body in Rome as long ago as 1887 by Monsieur de Foville and myself attention was directed to the difficulty. The German and the Belgian data seem indeed to begin at zero, and the holdings of the latter state, it has been said, include as units not only "gardens," but "*jardinets.*"

It is not, however, merely the nominal place and relative importance of the small holder that we must correctly appreciate before we embark on a new effort to provide for his more effective multiplication. The questions of what is his tenure of the soil he tills, and to what extent he owns his farm, and how

far he should be helped to do so by outside aid have been once again discussed. Here we come, as all committees who examine the matter come, into a very debatable region. It is not enough to quote purely *à priori* opinions as to the magic of property —not enough to recognise, as many practical agriculturists will, the real political advantage to their great industry of multiplying the number of persons who have a permanent interest in the land. Neither will quotations from the experience of other States help us very materially in this matter, although it is of interest to read how in Germany, or France, or Denmark, an opposite system to our own holds good. Considerations of quite a different order have to be regarded before any conclusion is reached, and history, experience, economic teaching, and political motives will all in succession be appealed to.

Still, we have one advantage now not obtainable in the older discussions. When I wrote on this question twenty years ago, we did not know—at least with any statistical precision—what proportion of our farmed land here was occupied by its owners and what by tenants. That information is happily now forthcoming, and although it applies still to the limited area known as technically cultivated, it coincides with that of the holdings return, and gives us certain results to begin with.

Taking the English figures alone, as before, the general report of the Board of Agriculture for 1905 gives the land owned by its occupiers as just 13 per cent. of the whole. Wide variation in practice appears in this matter between county and county. The highest proportion of land occupied by its owners at the present time appears to occur in Surrey, where more than one acre in three is so returned, a feature which is no doubt connected with the large use of land in this county for residential, rather than purely agricultural purposes. In the same way, in Berkshire, Hampshire, Middlesex, and Sussex, high percentages of owner farming, ranging from 23·8 to 27·6 per cent. are reported. At the other end of the scale will be found the counties of Cheshire, with less than 7 per cent. so occupied, and Lancashire with little more ; while in Yorkshire, Derbyshire, Durham, and Northumberland, the proportion of the land in the owners' hands is not up to 9 per cent. Even in Lincoln, in portions of which county colonies of peasant owners have always been noted, not 10 per cent. of the cultivated land returned in the yearly schedules is now described as owned by the occupiers—a far lower ratio than prevailed in 1888. Taking a broader view, the south-eastern and east-midland counties of England have over 19 per cent. of cultivated land in this category, and the proportion was even higher than this, or 22 per cent., when

these ratios were first shown in 1888. In the counties of the north and north-west less than half that ratio of owner farming appears to prevail. Taking these figures as a guide, there would not appear to be any advance, but rather, a definite decline in the practice of farming the soil directly by its owners. In the first year these statistics were collected (1888) very nearly 16 per cent. of the whole English cultivated area, against the present 13 per cent., was so returned. But too much should not be made of this movement which may, it is suggested, be largely due to somewhat better prospects in English farming and the readier letting of vacant farms than was the case in the earlier years of agricultural depression.

On the degree of owner farming in different sized holdings we have no later information than was given in 1895, when the proportion owned in each group of holdings according to size was worked out; but it is interesting to note that the ratio of owned land in the smallest sized holdings—those below five acres—was, in the year just quoted, practically the same as for the general average of the country, and was in excess of the proportion shown in the 1895 inquiry for any other grade of holding below 500 acres. In five to twenty acre holdings, the ratio quoted by Mr. Rew as his evidence to the Committee was below the general average, or only 12 per cent. In the next grade of twenty to fifty acre holdings and again in those running from that area up to 300 acres the proportion owned by the occupier was below 9½ per cent. In the larger holdings, over 300 acres, it reached a proportion very much beyond this, but the figures in the larger farms probably indicated not that more persons desired to farm their own land themselves, but that, as things were at that moment, tenants were more than usually shy of hiring farms.

However, the small proportion of the small holders of England who actually do own their farms is now a well-recognised figure, and one to which the very latest foreign data offer a striking contrast. In the German census, taken in the same year as the English inquiry just mentioned (1895), nearly two-thirds of the land in the smallest grade of holding, up to five acres in extent, was land owned by the occupier, who might be, however, and, as I have shown above, very often was, not primarily an agriculturist, but practised some other calling. In the class still higher in the scale, as much as 88 per cent. of the 41,000,000 acres so held in Germany was land owned by the occupier.

In fact, the German position is the exact reverse of our own, for only 12·4 per cent. of the land in farms was wholly leased land. The French proportion of occupying ownership

is nothing like this—probably just below half of the cultivated area. In Denmark, as many recent reports urge, the tenant farmer is conspicuous by his absence, freehold or hereditary tenure prevailing on nearly 88 per cent. of the total surface.

Despite all these contrasts it cannot be said from an examination of the latest evidence, that the English tenant or the English agricultural labourer shows as a rule any strong desire to become an owner. And on this point the pros and cons will be found to have been very carefully set forth in the new Report of Lord Onslow's Committee. It is, of course, not the place here to discuss the legislative efforts which have been suggested to enable the practice of owner farming to be very largely tried; but looking to the position which this question occupies, from other than a purely economic standpoint, one may wish well to the substantial experiments proposed in this direction.

Again and again in the discussion of this question one feels that there are points of the most varied character to be raised. At one time the subject is debated from the point of view of increasing the aggregate production of the soil by the intensive cultivation of minute areas, for the working of which relatively large amounts of capital and a relatively great expenditure of labour is indispensable. At another, it is not the question of additional production, but that of finding means for the employment of more persons on a given area that is the goal aimed at. What is more or less loosely called the agricultural population of a country bears in different circumstances very different relations to the area of its surface. We may have held up for admiration the condition of a country like France, which has a measured surface almost exactly four times that of England (taken by herself, without including other divisions of the United Kingdom), while the agricultural population may be more nearly six times as large. On a French surface of 130,000,000 acres we are told there resides a "rural" population of some 23,500,000, or 60 per cent. of the inhabitants of the Republic. Of these some three-fourths (17,500,000) are set down as belonging to the agricultural class, and that agricultural class includes dependents and consists of over 3,500,000 persons working on their own account, or employers of labour, and somewhat under 3,000,000 more employed as labourers in this industry, the balance of less than two-thirds being the families or personal servants of the workers. Our English statistics do not perhaps lend themselves to an exactly parallel classification. We have, it is true, in our last census a so-called rural population (very differently defined from that of France, however,) which is only 28 per cent. of the total population, and of these the

active agricultural population of the English counties (Wales being for the purpose of our present inquiry omitted) does not apparently exceed, if it even reaches, a million persons, although there is too little precision in the figures for any confident use of the total.

Again, if we attempt to follow the French classification of the elements of which the English million of active agriculturists is made up, we should find not quite 190,000 record themselves as farmers, while the remaining four-fifths are labourers, assistants, or other engaged auxiliaries. If a proportion of dependent families and servants of the active agricultural population were to be allowed and added on the French scale, *i.e.*, a little less than two per worker, the estimate — and of course it is a very rough one—would give us, including dependents, an agricultural population of somewhat less than 3,000,000 souls in the English counties alone.

That figure, it may be submitted, is the one to be placed against the 17,500,000 of our French neighbours. Now, as the ratio of the English area to that of France appears to be as one to four, it would follow that, were the two systems of agriculture identical, the English agricultural community would have to be expanded by nearly 1,400,000 persons beyond the total just arrived at. The question, then, to be solved is : How far the different density of the two agricultural populations is due to the greater multiplication of agricultural holdings in France ; how far to the natural conditions which dominate and prescribe the most profitable types of agriculture in the two countries ; or how far may it be due to the superior efficiency of English over French labour in achieving what I still regard as a relatively greater productive out-turn by the expenditure of a smaller labour force.

I am not going to inflict on my readers here what would be perhaps a tedious, if interesting, analysis of relative production and its economic cost. But the latter problem is worth a thoughtful and detailed inquiry by some of our younger investigators, equipped with accurate knowledge of the agricultural processes and the agricultural results of the two countries. The answer may be very different from that to be given if attention were confined to the political aspects of the case. In that event the preference may be given to any system, even if more costly in its expenditure of human force, on the ground of maintaining a larger country-bred and country-reared and country-loving population, as a make-weight to the less stable emotions of a purely urban electorate.

But France, though the nearest and most familiar object lesson in this permanent controversy, is not the only type to which the advocates of smaller units of agricultural management

turn. We hear a great deal of Denmark and the use made of its soil. Here we have a very small State, nearly as much smaller than England (still keeping to England proper) as England is smaller than France. Its 8,897,000 acres are little more than a fourth of our 32,500,000, and like the Irish, but unlike ourselves, the Danes seem to account for nearly all their surface in the area of their 250,000 separate agricultural holdings; while we divide only the 24,000,000 of cultivated land, or three-fourths of the surface, into our English quota of 372,000 holdings. Now, the entire Danish population is just over 2,500,000. Of these, three-fifths, or 1,500,000, are resident in rural communes, although not quite 1,000,000 of them are classified as agriculturists or their dependents, the active section of the class being 510,000, of whom 152,000 were employers, and 358,000 were employed. The interesting account of the progress of Danish agriculture given last year to the Royal Statistical Society by Mr. R. J. Thompson, brought out the small ratio of the dependent population, the large proportion of female workers, and the considerable labour force required. Upon 1,000 acres of Danish territory, the persons employed were seventy-three, compared with thirty-six in this country, and these figures will raise more than a passing criticism, that, after all, as a matter of economic production, the Danish development has another side not entirely to be overlooked.

The Memorandum appended to the Report of the Small Holdings Committee calls attention to some other features of the Danish case which have not perhaps yet received the attention they require. But no one has really worked out the aggregate production and aggregate expenditure and net profits of the Dane as we might like to see it done. It is, however, obvious that the Danish agricultural system is not one of extremely small units of management such as may be met with elsewhere on the Continent. The Danish average holding would be very much that of the Irish, or over thirty-five acres; but if the holdings under one and a third acre were excluded for better comparison with our own, the average would rise to forty-nine acres per holding, which is not so very much below the English average of sixty-six acres. Half of the Danish area—and it includes some land not used agriculturally—is farmed in groups of holdings between thirty-seven and 147 acres in extent, or with an average of seventy-three acres per farm.

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RURAL ROADS, WITH SPECIAL REFERENCE TO MODERN REQUIREMENTS.

In Volume 37 of this Journal, published in 1876, appears a most admirable and instructive paper by Mr. W. H. Wheeler, M. Inst. C.E., which deals with the history of roadmaking and the manner in which roads should be constructed and maintained. The greater part of that paper is of permanent value and is applicable to the conditions of to-day with unabated force, and it would be difficult to improve upon the excellent suggestions it contains.

During the last thirty years, however, the advent of the bicycle and motor car has led to a great revival of the interest in roads, and the public mind is now greatly bent on questions regarding them. The time therefore appears to be opportune for a restatement of some long-established truths, which unfortunately are too little regarded; and for a brief review of new conditions affecting the art of roadmaking.

Roads have fittingly been regarded as a symbol or measure of the civilisation of the country in which they are found. According to the Abbé Renel, if the community is stagnant the condition of the roads will indicate the fact. If they have no roads they are savages. Adam Smith asserted that "the construction of roads is the greatest of all improvements," and Ruskin said: "All social progress resolves itself into the making of new roads." From this point of view the people of the United Kingdom have little cause for congratulation; as, although the main truths regarding roadmaking were enunciated and demonstrated by Telford and Macadam in the beginning of the nineteenth century, they have been to a great extent ignored in the British Islands, especially since the introduction of railways, and, as a consequence, many of our roads are narrow, crooked, weak, and bad.

Central Control of Main Roads.

In France, the magnificent national department of "Les Ponts et Chaussées" was definitely established in 1712; but it did not hesitate to profit from the teachings of Macadam in 1830, and from that time the principal highways in France, then badly maintained, though well constructed according to a system apparently combining the best ideas of Telford and Macadam, have been the best in the world. The space now available does not allow of a detailed description of the admirable organisation by which the State practically controls the administration of all the important roads in France, including 23,820 miles of National Roads; but the system is worthy of careful study as it secures efficiency, economy, and general satisfaction.

In England and Wales about 27,380 miles of main roads through rural and urban districts (excluding county boroughs) are dealt with by 1,055 Councils, in addition to the County Councils, and the result, comparatively speaking, is ineptitude, waste, and discontent. With such a division of authority any approach to uniformity in procedure or results is hopeless.

For some purposes small areas of control and assessment are desirable to check extravagance, but they are not suitable or economical in connection with roads, and especially with main roads. The smaller road authorities now so common cannot provide for the services of highly skilled officers necessary for real economy, or arrange for the use of steam rollers and other modern appliances; and they are naturally prone to use local materials instead of more costly materials which, though brought from a distance, are often more truly economical.

Not infrequently a road with heavy traffic traverses a poor area which contributes little of the traffic and derives no clear benefit therefrom. Under these conditions, or on account of other adverse circumstances, such as a scarcity of good materials for roadmaking, or a heavy subsoil, it is hopeless to expect the authorities in small areas to reach any high standard of road maintenance. As raising money for the maintenance of roads by tolls on the traffic, which at first glance appears to be the fairest method of assessment, has been abandoned, an equalisation of rating for at least the main highways should be arranged for.

Skill and experience are not lacking for the improvement and maintenance of our roads, but even with so large an area as a county, and with the aid of very competent county surveyors, it is difficult and indeed almost impossible under existing conditions as to assessment for the necessary expenditure, to meet the demand for improved roads from those interested in traction engine and motor car traffic, and those, far the greater number, who use the highways otherwise, and suffer from the nuisance of dust raised by the swift self-propelled vehicles now employed.

Royal Commissions and Parliamentary Inquiries.

In 1833, a Committee of the House of Lords recommended "a system of general control over the management of the roads in the kingdom to introduce one general economical and skilful course of management," and they formulated a scheme for central control of the turnpike roads alone, to cost 97,000*l.* a year, which however was not carried into effect.[1] At that time

[1] This scheme proposed the appointment of two General Surveyors with a salary of 2,500*l.* each, and twelve deputy Surveyors with salaries of from 800*l.* to 1,000*l.* The value of skilled services in connection with roads appears to have been more fully recognised by this Committee than it is now.

some 23,000 miles of turnpike roads were controlled by about 1,200 Trusts, many of which had only from fifteen to eighteen miles in their care, and though their joint income was more than one and a half million pounds a year, they were unable to meet their expenditure, including interest on loans. In 1840, the cost of maintaining the turnpike roads was 66*l.* per mile.

In 1901, the Royal Commission on Local Taxation reported: "The maintenance of main roads we also consider on the whole to be to some extent a national service and likely to become more so owing to the increasing mobility of the population and the development of new means of locomotion." They recommended that a new annual grant equal to one-half of the annual cost of the roads, determined by some authoritative and impartial body to be main roads, should be made from the Imperial Exchequer, and estimated this grant at 1,000,000*l.*

In 1903, a Departmental Committee, appointed by the Local Government Board, reported that there are 1,855 highway authorities in England and Wales and that the mileages of roads of all classes which are maintained by many of the District Councils are very small. The Committee pointed out most forcibly the want of uniformity in the existing methods of road maintenance, and suggested that local sentiment should not be allowed to prevail over an effort to secure greater uniformity, efficiency, and economy in the maintenance of main roads. They recommended the formation of one County Board for each county to deal with all main roads therein, and expressed the opinion that the cost of maintaining trunk lines of roads throughout the country should be a matter for national, rather than local or county provision, and that such roads should be called "National Roads," and should be maintained under the supervision of a central body.

In 1906, the Royal Commission on Motor Cars, in their Report, referred to the new grant of 1,000,000*l.* recommended by the Royal Commission on Local Taxation, and pointed out that its motive was the relief of rates and not necessarily the improvement of, or any increase in the expenditure upon, the main roads. They expressed the opinion that, if any such grant were made, a portion should be applied to the improvement of the character of the roads as distinguished from their ordinary maintenance.

The latter Commission also stated :—

"It is recognised on all hands that modern developments of road locomotion have rendered necessary some modifications and improvements in the construction and maintenance of roads, so that no one method of construction, at once economical and effective, can at present be recommended; but one fact appears to be certain, viz., that in order to make the roads more suitable for the traffic of the present day, and to maintain them in that condition, a considerable outlay is required."

Mileage and Cost of Main Roads.

In England and Wales there are, as already stated, 27,380 miles of roads classed as main roads in an irregular and irrational way and charged on the county at large. In Scotland, all county roads are under the control of the County Councils, through a few District Committees in each county, and no roads are classed as main roads.[1] In Ireland all county roads are under the control of the County Councils, but the estimates must first be approved by the Rural District Councils. Main roads to an extent of from one-fifth to one-third of the total mileage have been declared in seventeen out of the thirty-two counties, and are charged one-half on the district and one-half on the county at large.

The mileage of public roads in the United Kingdom, excluding those in urban districts and county boroughs, is approximately shown in the Table on page 24.

In England and Wales the County Councils pay to the Councils of 825 Urban Districts an average amount of 221*l.* per mile per annum for the maintenance of 3,554 miles of main roads in these districts.

In Scotland the average cost per annum of 2,100 miles of streets and roads maintained by town authorities is about 224*l.* per mile.

Figures in relation to the mileage and cost of roads and streets in English and Irish county boroughs and urban districts are not readily available. The figures in the Table as to mileage and total annual expenditure on maintenance are taken from recent returns of the Local Government Boards, and the other figures are based on these returns. They show that the burden of taxation for rural roads would not be oppressive, if equalised, and that the nation could easily afford to provide better highways as quickly as the work could be done.

It is astonishing to find that in Ireland the mileage of rural roads is nearly two and a half times that in Scotland and nearly half of that in England and Wales.

The average cost per mile over the three countries is 26*l.* per annum, which is also the figure for Scotland taken separately.

According to all the evidence available, the maintenance of main roads in England and Wales has been greatly improved since the Local Government Act of 1888 came into operation. This might naturally be expected, as the annual cost has increased considerably throughout the country. On main roads maintained directly by the County Councils the cost of maintenance increased from 55*l.* per mile in 1897 to 72*l.*

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[1] Some minor roads, however, are maintained by Parish Councils, who in 1903-4 expended 3,272*l.* on them.

Table showing Mileage and Cost of Maintenance of Main Roads in the United Kingdom.

	Mileage of rural main roads	Mileage of other rural public roads	Total mileage of all rural public roads	Cost of maintenance	Cost per mile	Gross valuation of country per mile of road	Total acreage of land per mile of road	Average poundage rate to raise cost of maintenance
				£	£	£		
England and Wales	23,826			1,694,577	71	8,367	—	2*d.*
Rateable value		95,211		2,093,400	22	—	—	2½*d.*
199,355,590*l.* (1904)								—
			119,037	3,787,977	32	1,675	314	4½*d.*
Scotland	—	—	22,542	576,179	26	1,338	846	4¾*d.*
Rateable value								
30,144,822*l.* (1903)								
Ireland	—	—	54,064	779,174	14	280	376	1*s.*
Rateable value								
15,201,481*l.* (1904)								
244,701,893*l.*	—	—	195,643	5,143,330	26	1,251	—	5*d.*

per mile in 1904, or about 31 per cent. The rural main roads of England and Wales, with a mileage of nearly 23,826, now cost about 71*l.* per mile.

The national roads in France in 1904, with a mileage of 23,820, almost exactly the same as that of the rural roads classed as main roads in England and Wales, cost about 51*l.* a mile. These national roads constitute about one-fifth of the total mileage of the highways in France.

Though it must not be forgotten that the French climate is drier than that of England, that heavy waggons in France have wide tyres on their wheels, and that the road traffic in England is very heavy in many parts of the country, the difference between the results secured in France for 51*l.* and those obtained in England for 71*l.* is most striking.

Without information, not now available anywhere, a close estimate as to the total cost of putting the main roads of England and Wales into good order cannot be made. Even the mileage of main roads which properly merit that name has not been determined; but probably about 20,000 miles in the rural districts might properly be classed as national main roads; and an expenditure of 2,000*l.* a mile could be well applied, without extravagance, to improve these roads as to alignment, width, drainage, gradients, and surface, or say 40,000,000*l.* in all. Such an expenditure would not accomplish all that is required to make the roads worthy of the nation, but it would effect a great improvement and would be a good investment. In many cases the roads are strong in the centre and mainly require widening and strengthening at the sides of the carriageway.

The necessary funds might be borrowed at 3 per cent. for fifty years, and with a sinking fund accumulating at $2\frac{3}{4}$ per cent. the total annual charges would only be 1,550,000*l.* a year, or, approximately, the present annual cost of maintaining the rural main roads, which equals 2*d.* in the pound on the total rateable valuation of England and Wales. Even if the improvements led to no early reduction in the cost of maintenance, which they certainly might be expected to secure, the total annual charge for the improved rural main roads would be 4*d.* in the pound on the rateable valuation of the country—not a very alarming figure.

To secure proper value in the improvement of the trunk lines of traffic, the advantages of central control, free from local bias or popular pressure, should be combined with that of local knowledge by arranging for the execution of the works of improvement by the county surveyors (who are very competent officers), under the direction of a Government department.

It is highly probable that if Parliament enacted that the management of the main roads should be dealt with by a national department, and that the local authorities should be bound to contribute to this department not more than the amount they now expend on the main roads, the department, with the aid of the county surveyors, would before many years put the roads into a condition satisfactory to all members of the community, and costing less for maintenance than the present expenditure.

Most local authorities would be glad to give up the control of the main roads in their district, if they were assured of an improvement in their condition and were safeguarded against an increased charge on the local rates; but in any case, as was pointed out in 1903 in the Report of the Departmental Committee previously referred to, local sentiment should not be the governing factor in this important matter.

Government grants in aid of local taxation are not at present altogether satisfactory in their effect upon local administration. They do not stimulate most authorities to a fuller and more effective performance of their important duties, but are thrown into the general purse, which is too often unduly depleted for purposes much less important and of less general interest than the improvement of highways.

An effort should be made to extricate the existing grants, so far as they originally referred to roads, from the fund for general purposes; and the amount so retrieved and any new grants for a like purpose should be definitely applied towards the permanent improvement of main roads and a higher standard of maintenance. What is necessary as regards rural main roads in England and Wales could be effected by the definite application to them, out of the grants now made to local authorities, of a portion equal to about 2*d.* in the pound on the total assessable valuation, together with a new State grant of approximately equal amount.

Up to 1888 the State paid half the cost of the maintenance of the main roads; but this definite payment was then discontinued, and certain revenues were assigned to the county authorities in lieu thereof.

New Legislation Required.

Legislation giving effect to these ideas and enabling land, required for new roads or for widening and improving existing highways, to be acquired in a simple, speedy, and economical way would be welcomed by all classes.[1] At present no

[1] In Scotland the County Councils have no powers to acquire land for these purposes. In England and Ireland the powers available are inconvenient and costly to put in force.

administrative machinery exists for the construction of new trunk roads. The procedure might be by Provisional Order of the Local Government Board, who might be authorised, on the petition of any one authority interested in the construction or improvement of a main road, to constitute a temporary Board to deal with the whole question throughout several districts or even counties.

Wise legislation with regard to our highways is greatly needed, and it would have the following effects:—

(1) A great improvement in the condition of the main roads.

(2) A general improvement in trade and industries due to the increased facilities for transit afforded, the value of which would vastly outweigh the cost of the improvement of the roads.

(3) An ultimate saving in the cost of road maintenance.

(4) A practical cure of the mud and dust nuisance.

(5) The employment of many labourers for a number of years on works, the result of the execution of which would be an increased demand for labour tending to settle the unemployed question.

(6) An improvement in the facilities for moving troops and war matériel for the defence of the country against invasion. At present our roads cannot carry light traffic at high speeds nor very heavy traffic at any speed.

The following preliminary steps should, however, be taken:—

(*a*) To procure from the county surveyors accurate maps of all roads which might fairly be considered main or trunk lines, with particulars as to their width, gradients, and condition.

(*b*) To determine, by means of an impartial and authoritative body, what roads may properly be considered as of national importance.

From the preliminary maps of the county surveyors, and the existing records of the Ordnance Department, a very valuable general map could be prepared, and with such a map and accompanying schedules of the present cost of road maintenance, the main features of an improved system would be apparent and its cost could be estimated with confidence.

(*c*) To investigate the circumstances of all the county boroughs and urban districts as to the cost falling upon them for road maintenance, apart from scavenging and watering, and to prepare statistical tables to show the poundage on the assessable valuation due to such cost in every administrative area in the country.

Without such information the financial questions as to grants and area of charge cannot be properly considered.

Power-driven Vehicles.

The introduction of the bicycle in a practical form about 1880 directed public attention to the condition of the roads, but a further and immense stimulus in this direction has been produced by the invention of the motor car with pneumatic tyres. The need for better roads has become acute on account of the advent of the power-driven vehicle, which was rendered possible by the Locomotives on Highways Act, 1896, and there is now probably a greater unanimity of opinion than ever before existed in these islands that an improvement is desirable.

Every new kind of carriage or waggon, including the bicycle, when first introduced, was strongly objected to on the ground that it would destroy the roads or be dangerous to the public. The new vehicles, however, have always gained the victory, though, in the case of locomotives on roads, it was long delayed in Great Britain. The use of steam carriages on roads began about 1830, and was favourably reported on by a Parliamentary Committee in 1831, but although it was then confidently expected that the new vehicles would rapidly become established on a great scale, this hope was disappointed, mainly it is said, on account of the unfair opposition of persons interested in other methods of locomotion. Regarding this point, the Right Hon. Sir John H. A. Macdonald, K.C.B., Lord Justice Clerk of Scotland, gave most interesting evidence before the Royal Commission on Motor Cars, 1906, and set out the case for the abatement of the dust nuisance and encouragement of motor traffic in the following striking passage :—

"The dust question has become very prominent since the advent of the power-driven vehicle. To most it is a subject of bitter complaint. It will turn out that the awakening of the public mind to the problem of dust prevention, by the advent of the motor vehicle, will be in reality an ultimate blessing to the community, Dust is present on our public roads not because of the advent of the motor car, it was there before. The evil is not merely the throwing up of dust, the evil is having loose material on the road at all. Whether the loose material is dust or mud, it is not only an annoyance, but it is an evil from more than one point of view. It is an enemy to health, to vehicles, to horses, to pedestrians, and to vegetation, and a drag on commercial prosperity. It demanded the stimulus of a revival of the use of the roads to cause serious thought to be given to the subject. The mail coach days were the days of dust raising in clouds, as Bob Acres says on arriving at Bath, 'Warm work on the road, Jack, odds whips and wheels ; I've travelled like a comet with a tail of dust all the way as long as the Mall.'

"So fearful was the nuisance on much frequented roads that pumps were provided at enormous cost at every few miles on the Bath road, which was watered daily in dry weather.

"But the stoppage of all fast horse traffic by the rivalry of the railways led to the question of the prevention of dust being shelved for seventy years. Now it is again before us, and already invention has been stimulated and is far on the road to success.

"The free use of the power vehicles on the roads will confer the following among other benefits :—

"(1) A means of healthy recreation and health restoration to dwellers in crowded cities.

"(2) A revival of road touring on a great scale, and consequent revival of the country inn, good custom to which brings prosperity in its locality.

"(3) Convenient transit for passengers by which they can be taken up and set down at any point or house.

"(4) Omnibus traffic in towns with reasonable acceleration, and a cessation of wearing-out cruelty to horses.

"(5) Feeding the railways at points on the main lines without the use of branch lines.

"(6) A great increase in the range of delivery of goods from door to door, and increased postal facilities.

"(7) Mechanical traction for work on the land, ploughing, harrowing, reaping and carting both to markets and on the farm being done by one power machine and markets fifty miles off being reached in market hours.

"(8) Assisting to prevent the congestion of large towns.

"(9) Greatly improved sanitation by the elimination of foul matters from roads and streets.

"(10) The cheapening of transit by road for passengers and goods."

The other side of the question is ably set out in an article in the *Quarterly Review*, published in October, 1906, and was lately stated briefly by Mr. Hawkshaw, Past President of the Institution of Civil Engineers, who said he quite appreciated the advent of motors, and their great convenience and usefulness, but it was no good overlooking the fact that motor traffic in its present stage had already done much to destroy the pleasures and comfort of country life.

The Construction of Good Roads.

The difference between a successful roadmaker and one who fails in his efforts is of the same kind as that apparently subtle, but, in truth, simple difference which exists between a good cook and a bad cook, a successful photographer and one who fails to obtain good pictures. The success or failure may be based upon the use of exactly the same materials and exactly the same appliances, but we all know the wonderful difference in the results. The success is due to precise and thorough attention to details, some of which appear to be unimportant, and the failure to the absence of such attention.

Neither Telford nor Macadam originated the use of stones broken to a small and uniform size for the upper crust of roads, but they were the first men in the British Islands who, in professional labours, carried out effectively scientific views in road construction and maintenance. They were good cooks; those who preceded them and many who followed them were bad cooks.

Some of Macadam's views, especially as to the foundations for roads, were quite erroneous and were vigorously challenged by his contemporaries. At his instance, macadam was substituted for stone paving in some parts of London and, as might have been expected, proved quite unsuitable. As to

road maintenance he was undoubtedly a great reformer, but he was by no means a scientific road engineer like Telford. Macadam's views as to the uselessness of a foundation of large stones in all cases, cannot be upheld; though such a foundation is not required if there is a dry free draining and incompressible road-bed such as is afforded by gravel or sand. He appears to have confounded plasticity with elasticity and to have overlooked the fact that the bending of a road necessarily involves increased draught and internal wear of the road crust.

The enormous influence of Telford and Macadam and, to a minor extent, of Rennie, in the improvement of roads, appears to me to be due to their strong personal character and to their attention to the one main idea—*uniformity*, which, though not exactly expressed in any of their writings, was the important factor which differentiated their work from that of the earlier roadmakers, and also from that of many roadmakers of the present day. There was little difference in reality between the practice of Telford and Macadam in regard to the maintenance of roads, and Macadam's great success was due to the unselfish zeal and persistence with which he urged his views.

What is required for a good road, which should be clean, hard, and even at all seasons of the year, is a free draining or hard impervious foundation and practical uniformity in shape, in gradient between moderate limits, in drainage, in strength of coat, and in quality and size of materials. If those who have charge of our roads would keep before them the watchword, "Uniformity," with, perhaps, in addition, the ruling motto, "the maximum of beauty," which guided a very successful French roadmaker, M. Dumas, Engineer-in-Chief of the Ponts et Chaussées in 1843, we might, in a few years, obtain on most of our roads a vastly improved surface. Yet, too frequently, we find in the present day great stretches of road, the subsoil of which has never been properly drained and the shape of which varies greatly and is at few points right, repaired with carelessly selected materials, carelessly applied, and carelessly dealt with after application. The most fatal errors in connection with road making are the use of stones of uneven sizes, and the application of mud to patches. What is wanted on all macadam roads, whether the steam roller is used or not, is that the stones should as quickly as possible become consolidated into a kind of mosaic of uniform strength with the least possible proportion of soft materials. With or without steam rolling, stones with dimensions of more than two and a half inches soon present knobby projections above the average level, and are starting points of destructive wear and waste which increase in a compound interest way.

Stones two and a half inches in their greatest dimension represent cubes with a side of about an inch and a half.

The old roads in the pre-macadam days of the Grand Juries of Ireland, and of Mr. Abercombie, in Scotland, were said to be repaired with broken stones the size of a turkey's egg, which, with the old-fashioned kind of turkey, was probably about right. Absolutely no mud should be put upon patches of broken stone unless it is desired to form a new and bad road crust on top of the old road crust. Stones mixed up with mud will not work into the old road crust. Another vitally important operation for the maintenance of good roads in a really efficient manner is the removal of dust in the summer and of mud in the winter as quickly as it is formed. An eminent sanitarian lately stated with respect to the streets of London that one pound of dust, with the addition of water, produces seven pounds of mud. The removal of dust and mud should be effected by almost continuous cross sweeping, which is the only remedy for the tendency of soft roads to track in wet weather. Sweeping and scraping by horse-drawn machines is not so satisfactory as hand sweeping, unless frequently and carefully done. Sweeping is often much more useful, even in winter, than the application of broken stones. Where steam rolling is not used, all the materials should be spread in the last three months of the year, and the possible necessity for additional stones during a wet summer prevented by skilful manual labour.

Roads cannot be satisfactorily maintained without constant attention, which is best secured by putting short lengths in charge of efficient surface men. It should be noted with great care what road maintenance means. It means preventing the road from ever getting bad ; it does not mean allowing it to get bad and then in a desperate and impossible manner trying to make it good again. Except when stones are being spread or channels cleared out it is difficult for the ordinary passer-by to see, with proper road maintenance, the importance of what the surface men are doing. The true principle of their work is the "stitch in time." A good surface man is, however, a rare thing. It is of the utmost importance that hedges and trees, especially on the southern side of the road, should be pruned and cut, so that the sun and wind, which are great aids in road-maintenance in our climate, may have free access to the surface.

Road Foundations.

A good foundation is essential for every road which is to carry heavy traffic, but there has been much confusion of thought as to how such a foundation can be secured.

Telford did not, as is popularly supposed, invariably use a paved foundation for macadam roads, but suited his methods to the special local conditions, and 920 miles of roads which he constructed in Scotland for the Government were formed without pitching or paving. The subsoil or road bed is the real foundation, and if this is dry, uniform, and well drained no special foundation courses are required, but only a moderate thickness of crust.

Mr. Thomas Codrington, at one time Superintendent of Welsh Highways, carried out some most interesting experiments which showed that the load on a wheel is transmitted to the subsoil or foundation by a portion of the road crust roughly of the form of a truncated pyramid, the sides of which are inclined at an angle of about 45° with the horizontal plane. This simple fact explains why a traction engine wheel often breaks through a road, though the load per inch of width of the wheel is not so great as that on a cart wheel, and it also explains how increased strength is obtained by thickening the road crust. In the first case the area of the bottom of the truncated pyramid is not proportionally much greater than the area of its top ; in the latter case the bottom area considerably exceeds that on which the cart wheel bears. A road requires such a thickness of road crust and foundation courses as will lead to a distribution of the load over an area of subsoil sufficient to carry it without sensible compression, and the actual area required for a given load depends in most cases not only on the nature of the subsoil, but also on the degree to which it is drained and protected from the access of water. The distribution of the load is evidently dependent not only on the thickness of the road, but also on the extent to which the crust is consolidated, as with a well-knit crust the angle of distribution is flattened.

In the construction of modern roads a hard set pitching or pavement is not generally used as a foundation for macadam roads, though it may be adopted with great advantage if the subsoil is of a clayey nature and suitable stones are easily procurable. In Great Britain and on the Continent roads are now generally made with a rolled bottoming or foundation course of large but uniformly sized stones, about six inches deep, laid on the subsoil (after it has been well drained and rolled) and covered by a layer of broken stones, two inches in size, rolled to a finished thickness of six inches. A layer about three inches thick of gravel, clinkers, or ashes is sometimes first laid on the road bed to separate the bottoming from the subsoil if it is soft or retentive of water. Concrete makes an excellent foundation for a macadam road, but its cost is almost prohibitive except in cities and in connection with block paving and asphalt.

The vehicles which try the foundations of roads most severely are traction engines, and the law regarding them is in much need of revision. In the opinion of Mr. Maybury, the County Surveyor of Kent, where 170 traction engines are regularly at work, there is now no economic necessity for such appliances, owing to the advent of the heavy motor; and it is to be hoped that, if traffic with traction engines is to be continued, they will ere long be improved by the application of the "Pedrail," or otherwise, in order to reduce the damage they now cause by tearing up the road surface and deforming or breaking through the road crust. A traction engine concentrates weight and forces tangential to the road surface to a much greater extent than any other vehicle.

Drainage.

The drainage of the subsoil and surface of roads, though a matter of the very greatest importance, seldom receives sufficient attention and is rendered difficult in Great Britain because a sufficient width has seldom been secured or retained for the roads. On many miles of our highways the cost of special piped drains laid under the centre of the road for subsoil and surface drainage would be amply repaid by a decrease in the cost of maintenance. Open drains are out of the question in most cases and should not be tolerated on the road sides except where separated from the travelling way by a fence or wide sodded margin. When closed drains are used, the outlets for surface water should be of a simple, safe, and strong design, with detritus pits and hinged gratings.

According to evidence given by Sir John Macneil in 1831 before the Select Committee on Steam Carriages, the wear on a portion of a road on a wet clay bottom was found, by accurate experiment, to be eight times as much as the wear on another portion of the same road with a solid dry foundation.

Quality and Size of Materials.

For the lower layers in road construction any moderately hard stones may be used, but for the upper layers which form the working surface it is true economy to take every pains to obtain materials which are hard, tough, and impervious. The best materials are certain kinds of granite (many granites are too soft for macadam), syenite, diorite, and basalt. For the upper crust of roads the stones should be broken to pass in any direction through a ring not exceeding two and a half inches in diameter. In Mr. Wheeler's paper already referred to, particulars are set out of the great saving made in the maintenance of roads by the use of granite, costing 13*s.* 6*d.* per ton, instead of local materials costing less than

half that price. In Gloucestershire it is now found that it is much more expensive to use local materials obtainable at 3*s.* 6*d.* a ton than to use better materials at 14*s.* 6*d.* a ton. It is of the utmost importance that the stones should be evenly sized, and all pieces markedly larger and smaller than the required size should be screened out. If stones of different sizes or qualities are used in the same layer it is practically impossible to secure a uniform coat, and without uniformity in the road crust the preservation of a smooth surface during wear cannot be hoped for. A return to the use of forks or pronged shovels instead of ordinary shovels for lifting and spreading broken stones is well worthy of consideration. Surveyors are divided in their opinions as to whether stones broken by hand or by machinery are best adapted for the repair of roads. No general rule can be laid down, but if the jaws of the stone-breaking machine are kept in good order and fed with properly sledged pieces of sound stone, not inclined, as some special stones are, to break into flat or long pieces, and if suitable screens are attached to the stone-breaker, there is no doubt that greater uniformity in size and shape is obtainable than with hand breaking. Moreover, the fact must be faced that the hand stone-breaker is almost extinct.

Importance of Uniformity in Cross Section.

The importance of having a nearly uniform cross section from fence to fence for the whole length of a road cannot be overestimated. The exact section itself is of minor importance, but that of the travelling way is better flat than too round, as drainage along the road is much more effective than cross drainage, and no amount of cross curvature will drain off water from a rut on a road. The water channels should, as specified sixty years ago, be at the same levels on both sides of the road and should be as small as possible; and where there is no footpath the margins should be neatly dressed to true lines and so that they may be slightly higher than the road and have a slope thereto, pipes being formed where necessary under the footpath or margin to drain the channels. If there is a deep water channel or excessive cross curvature or a grip or open ditch on one side of the road and within the fences, the road will not wear evenly; but with a road properly formed there is no reason why one portion of the road should receive much more wear than another, and if, at night, a wheel gets beyond the travelling way no accident occurs.

Patches applied without steam rolling should be of moderate size, of a length about equal to the width of the road, and of a width of about one-third thereof, and should be laid down zig-zag, so that a horse may travel along the road without

putting his foot upon a loose stone. With such spreading the wheels take the edges and corners of the patches, and they are speedily consolidated at a level approximating to that of the old surface, without the use of any blinding material.

Road Rolling.

The rolling of roads by horse power was advocated by John Shotbolte in 1619, Robert Phillips in 1736, M. de Cessart in 1787, and P. H. Clay in 1817; and the most strenuous and effective advocate of this process was Sir John Burgoyne, the first Chairman of the Irish Board of Works, who a few years after it had found favour in France issued an excellent paper on the subject in 1843.

The repair of roads by means of a steam roller was commenced in Paris about the year 1864, and in England a few years later. It is best effected by sheeting a considerable length of roadway with stones of uniform strength and size. The stones should not be larger than those used for ordinary patching, and the consolidation of the sheeting, which should not exceed at most four inches in depth, should be secured by rolling in such a manner as to ensure the rapid and, as far as possible, full consolidation of the sharp angled pieces of stones with the minimum quantity of what is called "blinding." It is very important in the repair of roads with a steam roller to have the stones of moderate and uniform size. If they are not so, it is impossible to compact them to the extent required, and the longer they are rolled the more difficult consolidation often becomes, especially if the stones are, as they should be, of uniformly good quality. The road mender is then forced to throw on excessive quantities of soft material, and the result is a most unsatisfactory road crust, which wears unevenly and throws up excessive quantities of mud.

With well applied rolling a saving of about one-third of the materials can be effected, less cleaning is required, the torture of loose stones is obviated, and a smooth and easily maintainable road surface is quickly secured.

All steam rolling should be carried on under the constant supervision of a responsible person, who can be trusted to do exactly what his chief has directed. Without such supervision a roller gang will usually hurry over their work and produce most disappointing results. When the writer started steam rolling in 1891 in the county of Down, he put the steam rollers in charge of young civil engineers, who stood by them during all working hours, and furnished returns each day of the amount of stones, blinding, and water used. He insisted that a long straight-edge and spirit level should be carried with each roller, and gradually induced the men to believe that

the use of the straight-edge and level is necessary to secure a uniform cross section.

The surface on which the stones are to be laid should, as far as possible, be made uniform as regards drainage, shape, and consolidation, and the stones spread as nearly as may be of uniform depth. The coating should be thoroughly rolled dry and without the admixture of any blinding, though scarifying or wetting the old surface slightly to secure rapid incorporation is sometimes desirable in light coating. The dry rolling should be continued until the stones show a markedly mosaic appearance, and then, and not till then, the smallest possible quantity of blinding should be applied by making up a slurry, like very thin mortar, in the road channel and sweeping it towards the centre as rolling proceeds from each side. The quantity of dry blinding should never exceed about 5 per cent. of the quantity of stones to which it is applied with ordinary depths of coating. The one thing to bear in mind is that to secure the best work practically no blinding should pass below the top layer of stones; it should merely fill the fine joints already secured by dry rolling. The quality of blinding to be used with steam rolling should be very carefully considered. The writer tried all kinds except the nearly pure vegetable soil, which is frequently used with disastrous effects; and he is of opinion that the best blinding obtainable is old road mud from which the softer materials have been washed and weathered away. New road mud contains too great a proportion of soft and organic matters for use as blinding. Very fine stone screenings also make good blinding, but it should always be remembered that it is not so much "blinding" as "binding" or joint closing which is required.

Kleinpflaster and Brick-paving.

In a perfect macadam surface stones of equal size and strength lie closely packed together with a very fine network of joints thinly masked with hardened mud worn from the stones. Such a surface can only be obtained by placing the stones by hand on a carefully prepared and equally consolidated foundation, in the way that almost everlasting footpaths have been formed by setting on edge by hand on a uniform foundation narrow chips of stone or flat waterworn pebbles of nearly uniform size. This method is called "Hornizing" in Scotland, and it was somewhat closely followed in forming roads, with a minimum of soft material in the road crust, in the Province of Hanover, where there are few quarries, at a cost of only from 10 to 20 per cent. over that for a new coating of ordinary macadam, and with most satisfactory and economical results. In 1895 fifty-two miles of roads had been

improved in this way; the earliest portions of the work, ten years old, were then in good order, and it was proposed to lay fifteen and a half miles more in the same way. In this work the old macadam surface was first carefully levelled up and solidly rolled with any necessary amount of new metal and the surface stones set thereon in a half-inch bed of sand or fine gravel. These stones were dressed approximately to the form of cubes two and a half inches to three inches in the side. In practice, it was found that exactness of shape is not essential, but that special attention must be given to secure a good uniform foundation and that adjacent stones should have the same thickness. The system is equally applicable to the formation of new roads or the improvement of a worn-down macadam road, and is known as "kleinpflaster," or small paving, in Germany, and more recently in England as "armoured macadam." Usually the joints are filled with sand, but unless it is of high specific gravity or possesses coherent qualities, it is apt to be displaced in dry weather. In Liverpool, pitch grouting has been found most satisfactory with kleinpflaster. The Welsh Granite Co., Carnarvon, have lately introduced special machinery for the preparation of the stones used in this kind of construction.

It is almost certain, having regard to experience with brick pavements, gained in Holland and in America, that excellent results at a moderate cost could be obtained in Great Britain by the use of small cubical bricks for kleinpflaster work, and there is a very hopeful field for investigation in this direction, as, with modern grinding and mixing machinery and brick kilns, bricks of great uniformity can be obtained. Roads with brick pavements are generally preferred in Holland, and they are very extensively used in the United States, where their cost, including a concrete foundation, is 6*s.* to 7*s.* a square yard. Professor Ira O. Baker states that bricks made from shale are best, that brick pavements are adapted for all gradients, wear smoothly, and have been found to stand heavy traffic for more than ten years most satisfactorily.[1]

Road Pavements.

A perfect pavement for roads and streets has not yet been obtained. The ideal pavement should be smooth to the wheel and rough to the hoof, almost noiseless and impervious, so that it may not absorb dirty water and, when drying, give off offensive emanations. The pavement of the future appears to be an asphaltic pavement containing a sufficient amount of grit or sharp sand to remove the difficulty often felt as to foothold for horses, which difficulty can be dealt

[1] See *Public Works*, Vol. IV., No. 3.

with in most cases by ample cleansing with water. Much may be done to improve this foothold by the use of india-rubber shoes or, as another authority suggests, by allowing the frog of the horse to reach the road surface.

Macadam is quite unsuitable for use in towns when the traffic is at all heavy, and should be replaced by more solid and impervious material when the cost of the maintenance of the macadam exceeds about a shilling per square yard per annum. Stone pavements are durable and are much more easily cleansed than macadam, but are too noisy for use near dwellings. Next to asphalt, the pavement which is most nearly what is desired for use in town streets is wood paving, which should be of hard wood and laid directly on a carefully prepared concrete foundation. The costs of stone paving, wood paving, and asphalt paving of the best descriptions are approximately the same, and considerations other than those of cost, therefore, determine their selection.

The draught on asphalt roadways is only two-thirds of that on stone setts, and only from one-fifth to two-fifths of that on macadam surfaces of the ordinary kind, according to their condition. The best kind of asphalt paving used in Europe is obtained in the natural form of rock, which is reduced to powder, laid hot, and compressed by rolling or trowelling. A cheaper kind is more artificial in its character and is laid in a semi-fluid condition. The objection to both these kinds of asphalt is that in certain conditions of the weather the surface becomes slippery, and it is not even with the greatest care suitable for steep gradients. It is, however, a perfectly sanitary pavement, preventing the pollution of the subsoil and the upward passage of foul ground air, is easily cleansed with water, and dries rapidly. Objection has been taken to the fact that it seals the ground surface and may lead to a greater access of foul ground air to the houses on the sides of the street; but this objection has no cogency if all such houses have, as they ought to have, an impervious stratum below the lowest floor to shut off the ground air.

Asphaltic pavements are comparatively noiseless, the only sound on them being that of the horses' feet, which is not greater than is desirable for the safety of pedestrians. In this respect it is practically the same as hard wood paving. The question may then be asked, Why is asphalt not more generally used? The true answer appears to be first that municipal authorities in Great Britain have not yet seen their way to provide properly for the cleansing by water of the surface of the streets; and, secondly, that the owners of horses adhere in the most conservative manner to the iron shoe, the origin of which is lost in the mists of antiquity. Asphaltic

roadways are more easily repaired than any other kind of pavement.

Wood paving, with its numerous joints and comparatively soft and elastic surface is satisfactory as regards noise and foothold for horses, though in certain conditions of the atmosphere it may become quite as slippery as asphalt, and it is not adapted for steep gradients. It has the tremendous drawback that it is porous and does not dry rapidly unless treated very carefully with creosote or other materials which are used to close to some extent the pores of the wood and prevent its decay. In spite of such precautions, and to some extent on account of them, the dust from streets with wood pavement is very offensive and irritating to the eyes and throat in long-continued dry weather. Breaches made in wood paving are difficult to repair in a neat and satisfactory manner ; and as it is also a matter of the utmost difficulty to secure blocks with uniformity of resistance to wear, it is remarkable that wood paving should retain the hold it has on the favour of many city engineers. It is supposed to have an advantage over asphalt paving when tram rails are laid in streets, but in Berlin, and elsewhere, tramways have been successfully laid in asphaltic paving, with and without lines of stone alongside the rails. In Australia, whence come the hard woods most in favour for street paving for heavy traffic, wood paving was stated to be practically discarded a few years ago. In America brick paving and a special kind of asphalt are in general use in preference to the forms of paving most commonly used in Europe.

The modern American asphaltic work is carried out with natural bitumen obtained in Trinidad, where a large deposit of this valuable material is found in a comparatively small area from which, between the years 1893 and 1902, about a million tons of bitumen have been obtained, mainly for paving works in America, but partly for use as an insulating material. Professor Louis, of the Armstrong College, estimates that the supply is not inexhaustible, but that there should be about fifteen million tons of bitumen remaining in the Pitch Lake, which is the principal source of supply, and has an area of about 140 acres. In forming asphaltic roadways in America, from 12 to 15 per cent. of refined Trinidad bitumen is mixed with 70 to 80 per cent. of sand and 5 to 15 per cent. of limestone dust. These materials are heated and stirred together into a stiff mastic paste, which is laid two inches thick on top of a first layer of finer stuff of the same nature, applied to the concrete foundation to unite the wearing surface thereto and prevent "creeping." This process requires great judgment and experience, but the same may be said of any street pavement

work. It should also be noted that in America these asphaltic pavements are sometimes formed with blocks instead of with sheets of asphalt laid *in situ*. The great feature of this American asphalt work is the comparative freedom from slipperiness that is said to result from the admixture of sharp sand, and this freedom is really the only quality in which asphaltic pavements as hitherto constructed in Europe are seriously deficient. Mr. E. North, C.E., states that in New York traffic has abandoned 93rd Street, which has a gradient of 1 in 20 and is paved with granite, for 94th Street, which is paved with asphalt and has a gradient of 1 in 17.

This system is now said to be making headway in England, though early experiments with it failed, probably on account of the want of the detailed care so necessary but hard to secure in connection with roadmaking. The writer was lately struck by the good appearance of some asphaltic footways in the city of Waterford, and spoke about them to the city engineer. He stated that they were made by an old foreman, who died some years ago, and that the loss of this man, whose heart was thoroughly in his work though he was always as black as the pitch he dealt with, had made it impossible to secure work of the same kind of equal quality and durability. The personal equation is nowhere of more importance than in connection with road work. The man is always of as much importance as the method.

The writer would here draw attention to the fact that any person can use upon the public highways vehicles constructed in the most ramshackle manner, which, as regards noise, are instruments of torture to other people, and that there is now no limitation in the statutes as to the minimum width of tyres of cart wheels. The width of tyres can be regulated in England and Wales by bye-laws under the Highways and Locomotives Act, 1878, and in Scotland under the Roads and Bridges Act, 1878, but there is no power to make such bye-laws in Ireland. If all vehicles were constructed in a rational manner, with springs and simple arrangements to keep down jar and clatter between parts of the vehicle, it might then be possible, even without a great improvement in our roadways, to reduce the noise of traffic very considerably ; and if farmers and carters were constrained to use wheels with a width of tyre of about four inches, it would be much easier to keep macadam surfaces in good order. The extra cost of such wheels would be about 30*s*. a pair at most. Great public benefit would result if it were enacted that by, say, January 1, 1910, all carts with the present knife-like wheel edges should be illegal throughout the kingdom, and, further, that all vehicles intended for use in towns should be reasonably constructed with a view to save

the roadway from unnecessary jolts and abrasion and the ears of the people from avoidable stress and strain.

The Dust Nuisance.

The dust nuisance and the insufficiency of the highways in the British Islands for rapid or very heavy traffic being the difficulties which road reformers are seeking to overcome, it is advisable to consider briefly what has been done or proposed to secure the needed improvements. The motor car has come to stay. In its heavy form it concentrates heavier loads on the foundations of roads than ordinary vehicles impose, and in its lighter and more rapid forms it causes the dust nuisance.

To remedy the dust nuisance it is necessary to take special pains by careful construction and maintenance that the roads shall be as dustless as possible. This, with ordinary macadam, can, in many places, be effected by the cross sweeping, which is a necessary part of good road maintenance. On very important lines there would be little difficulty in applying, for the removal of dust, a pneumatic machine similar to that now used to extract dust from carpets and house furniture. The makers of motor cars should continue to direct their careful attention to an investigation of the best form of cars, wheels, and tyres, for lessening or preventing the fanning and suction action which raises the dust. The action of a car in this respect depends not only on the form of the carriage, but also on the way the springs are fixed and the steadiness in running of the engine.

The absolute cure for the dust nuisance would be the use of (*a*) macadam fixed by tar or a similar binding material of better quality; (*b*) kleinpflaster, otherwise known as hand-set or armoured macadam; or (*c*) brick or stone pavement. Roads constructed with these materials are easily cleaned, and motor cars can be propelled on them with the minimum tractive force, and, as a matter of course, travel more smoothly on them than on the best ordinary macadam surfaces. It appears to be idle to try to find a cheap liquid material which will fix or keep down dust on an unscientifically constructed road surface; the cost of such materials would be better expended in making a permanent improvement in the road crust.

Those in charge of our highways may be fairly expected to give special care, in the interest of motorists and the public generally, to the proper banking up of the road on the outer side of curves and to keeping hedges and trees well cut down at the same points, and near cross roads, to enable the road to be seen as fully as is possible for some distance ahead. Roads may be so banked up at curves without any disadvantage to ordinary traffic and without adding to the trouble or cost of maintenance. In any case, all deep channels and low sides

should be abolished. On the kind of road surface which the general public are entitled to demand, side slips should be rarely experienced. It is moreover most desirable that the travelling way should be widened at cross roads, and the roads joined by easy curves. All main roads should have footpaths or wide grass margins.

It was lately proposed to construct special motor roads to join London, Southampton, Portsmouth, Brighton, and Dover, the main line being from London to Dover, of a length of forty-three miles, with branches fifty-seven miles and sixty-six miles long. A company bearing the title, "Motor Roads, Ltd.," was registered with respect to this project on September 30, 1905, with a capital of 150,000*l*. Nothing definite had then been decided upon as to the road surface or charges for the use of the road.

The Royal Commission on Motor Cars, in their valuable Report, issued in 1906, deal at considerable length with this question, but give no very definite recommendation as to the course of action which should be adopted or the detailed methods which should be employed for its solution. As their conclusions closely confirm the opinions on the subject originally formulated by the writer in 1905, he ventures to quote from the Report as follows :—

"There is no doubt at all about the dust nuisance; during the summer months it exists more or less on all frequented roads, but more particularly on the great main roads and within a radius of thirty or forty miles of London, and it causes material damage, discomfort, and annoyance to users of, and dwellers by, the highways. . . . It was generally admitted, and we have no doubt of the fact, that pneumatic tyres of motor cars from their suction and the propelling action of the driving wheels, are especially liable to lift up dust lying on the road and to draw out the binding of the road, particularly if the binding is originally of a loose and inferior description. . . . There seemed to be a general belief, in which we concur, that a car standing high from the ground, with a clear smooth run for the draught beneath it, is the build calculated to produce least dust. . . . Speaking generally, we came to the conclusion that at a speed below ten miles an hour the dust raised is comparatively slight, that it increases very greatly however at from, say, twelve to twenty miles an hour, and continues to increase but in a smaller proportion at higher speeds. . . . There is no doubt that a well-constructed road made of hard stone, carefully laid on a good foundation, with proper filling or binding material, and well rolled, will produce far less dust than a poorly constructed road, made with some soft or unsuitable stone of the district and filled in with road scrapings or other unsatisfactory binding, as is often the case. . . .

"Generally speaking, the evidence suggests that the best type of macadam will probably be found the most effective and economical road for all kinds of traffic, including both heavy and light motor cars. In localities where (*a*) exceptionally heavy vehicles and loads are common, *e.g.*, in the neighbourhoods of large manufacturing towns, or where (*b*) precautions against dust are exceptionally necessary, specific treatment was suggested. When provision is to be made for exceptionally heavy traffic some harder and more durable and therefore more costly pattern of road would have to be employed. In this connection the system of armouring a metalled road surface with stone blocks,

known in Germany as kleinpflaster and in Liverpool as random setts, is, in our opinion well worthy of careful consideration by road authorities. It was alluded to more than once in the course of the evidence by the principal road experts we had before us, who had themselves examined it, and it was always characterised as a most effective form of strengthening existing roads up to the standard of real efficiency for the carrying of heavy traffic. The method of laying it in Germany and the cost of labour and material are given in detail in Captain Bigham's Report on Roads.

"To meet the cases of towns and villages traversed by dusty main roads, some adaptation of the French tarring process has been suggested, and details of the method used and the cost are given in Captain Bigham's Report. Although such a system would be too expensive for application on all main roads, involving, as we are told it would, an annual cost of from 40*l.* to 50*l.* a mile for an 18-ft. road, yet if applied in such localities only as we have mentioned the price might not be thought too great for such an effective remedy. Road authorities in several parts of England have experimented on short lengths with tar, tar-mac (a road material composed of iron slag broken small and boiled in tar), Westrumite, and other dust preventives; but these experiments have not been on a sufficiently large scale or carried on long enough to afford any satisfactory information as to their success or cost."

Tarring, Tar Macadam, &c.

Tar macadam has been used from time to time in the British Islands for many years, and the use of tar applied to the surface of paths and roads, which the Commission calls the French tarring process, was practised by some English surveyors long ago. The Report of Captain Bigham referred to is an admirable one, and in it the cost of kleinpflaster is given at 4*s.* 9*d.* a square yard when laid on an old macadam road, and 7*s.* when laid on what is usually known as a Telford foundation seven inches deep, first overlaid by three inches of small broken stone. The total cost for a mile of new road eighteen feet wide would therefore be 3,663*l.*, and for armouring an old road 2,529*l.* This cost per mile appears to be quite within the resources of urban authorities, and it would not be extravagant to use armoured macadam on some rural main roads, as the reduced cost for maintenance and cleansing would meet, to a great extent if not entirely, the interest and sinking fund on the cost of the improvement.

The only other material for the cheap construction of road crusts, suitable to the needs of the present time on main roads, is tar macadam, of which tar-mac may be considered as a special variety, with some advantages due to the porosity of the slag, but somewhat likely to wear irregularly on account of want of uniformity in strength. Tar macadam can in some localities be laid four inches thick for about 2*s.* per square yard, but the cost per square yard for laying it, in 1905, six inches thick on the Victoria Embankment, where the results were not altogether satisfactory, is stated at from 4*s.* 6*d.* to 5*s.* 3*d.* per square yard by the Engineer to the London County Council. There are two serious difficulties in connection with tar

macadam which have led to a great variety in the results hitherto obtained: first, the necessity for dry weather during the execution of the work; secondly, the varying qualities of tar, which is a highly complex substance. If over-distilled it loses its binding qualities, and if under-distilled it softens in warm weather. Moreover much of the tar produced with modern systems of gas making, is not of a kind well adapted for tar macadam; and on the whole, though this kind of treatment has given most satisfactory results where skilfully applied in good weather, it requires very careful experimental investigations such as are now being carried out by the Roads Improvement Association, before it can be considered quite satisfactory or reliable.

The life of tar macadam is about twice that of ordinary macadam and it requires to be re-surfaced in two to ten years according to the traffic. Tar-mac laid at Newark showed no sign of wear after being subjected to very heavy traffic for two years.

Mr. Aitken, of Cupar, Fife, a most successful highway engineer, and the author of one of the most modern books on roads, has lately invented a tar-spraying machine, using compressed air, with which he hopes to be able to prepare tar macadam, and to apply tar to the surface of finished roads at a trifling cost. Mr. A. Gladwell, Surveyor to the Eton Rural District Council, lately reported that he is obtaining excellent results in re-coating roads by rolling clean granite into a bed of fine stone chippings, about three-quarters of an inch thick, mixed with tar. He states that under the roller the tarred mixture is forced upwards, thus filling the joints in the granite coating in a satisfactory manner, and that owing to the ease and rapidity with which the work can be done, and the saving of watering when rolling, no extra cost is involved in laying the improved coating. Many experiments have been made to secure a thin waterproof and durable skin or coat on the top of macadam, but the prospects of success in this direction appear to the author to be slight.

What engineers are in need of is a material of moderate cost, better than tar, for use as a binder or matrix for macadam; and the writer believes that if chemists experimented with Trinidad bitumen and other similar substances, what is required might soon be found. Mr. Brodie, the City Engineer of Liverpool, has already attained a considerable degree of success in this direction. The use of Portland cement as a binding material was tried many years ago, and it appears to be worthy of new trials; but obviously with such a rigid binder it would be necessary to have a very rigid foundation. It is stated that concrete pavements for heavy traffic have been thoroughly tested with good results in Chicago and Denver during the last two years.

When the horse is finally driven from our highways there will be no objection to surfaces only rough enough to give a grip for driving wheels; but in the meantime, and for many years to come, unless there is a rapid and general change in the method of shoeing horses, the requirements of the users of ordinary carts and carriages must be considered.

Very valuable experimental work is now in progress in the counties of Middlesex and Kent, on some of the main roads, which, under the present administration, are being rapidly raised to a high standard of excellence; and as the roads in these counties are particularly subjected to heavy motor traffic of all kinds, this pioneer work is worthy of the most careful attention by those interested in our roads.

A very simple instrument called "The Viagraph" has been invented by Mr. John Brown, F.R.S., Belfast, for taking an autographic record of road surfaces, and by its use accurate information can be readily obtained as to the relative values of various methods and materials for road construction and maintenance.

In conclusion, the writer desires to express the opinion that a paper of this kind, on so great a subject, cannot adequately deal with the questions involved. The principal value it may conceivably have is to attract the attention of thinkers to important phases of the problems under consideration, so that they may investigate them with some degree of thoroughness, and, having attained a sure faith, strive, according to their opportunities and powers, to exemplify it in good works. There is in the subject a great opportunity for legislative and administrative ability.

P. C. Cowan.

Local Government Board,
Dublin.

Short List of Publications regarding Roads, to which Reference is recommended.

A Treatise on Roads, by Sir Henry Parnell, published in 1833. *A Practical Treatise on Making and Repairing Roads*, by Edmund Leahy, published in 1847. *The Maintenance of Macadamised Roads*, by Thomas Codrington, M.Inst.C.E., 1892. *Pavements and Roads*, "Engineering and Building Record," New York, 1890. *Special Consular Reports on Streets and Highways in Foreign Countries*, published by The United States Government in 1891. *Highway Construction*, by A. T. Byrne (publishers, John Wiley & Sons, New York). *Road-making and Maintenance*, by Thomas Aitken, M.Inst. C.E., published by Charles Griffin & Co., London, in 1900. (New Edition in the Press.) *The Construction of Roads, Paths, and Sea Defences*, by Frank Latham, published by the Sanitary Publishing Co., London. Valuable articles will also be found in the Proceedings of the Institution of Civil Engineers and the Incorporated Association of Municipal and County Engineers.

THE APPLICATION OF MENDEL'S LAWS OF INHERITANCE TO BREEDING PROBLEMS.

In consequence of the re-discovery of Mendel's Laws of Inheritance,[1] published originally as far back as 1865, attention has again been called to the scientific study of breeding problems. Investigations are now being pushed forward by many workers, and the extraordinary certainty with which the complex problems of heredity can be unravelled has shown that the hopes of a few years ago, that breeding would become a precise subject, are rapidly being realised.

Of the man directly responsible for this, Gregor Johann Mendel, we know singularly little. He was born in the Austrian Silesia at Heinzendorf, in July, 1822. In 1843, he entered the Augustine convent at Altbrünn as a novice, becoming a priest in 1847. From 1853 to 1868 he was teaching natural science in the Brünn Realschule. Whilst so engaged he carried out numerous experiments in cross-breeding, using many kinds of plants for the purpose. With the exception of his classical experiments with peas, which led him to enunciate the now well-known laws, the existing records of these are fragmentary, and beyond some preliminary investigations on beans and Hieracia, we know nothing further of them than is contained in a short series of letters sent to the German biologist, Nägeli. These letters have recently been published by Correns, but unfortunately they reveal next to nothing of the man himself. In 1868 he became Abbot of Brünn, and shortly afterwards he appears to have abandoned his scientific work. He died in 1884, an unknown man as far as the scientific world was concerned. His work was not re-discovered until 1900, but in the few years that have passed since then its influence has been so far reaching that it has completely altered our outlook in more than one branch of the study of genetics.

On its re-discovery six years ago, many experiments were started to determine whether Mendel's Laws of Inheritance were of general application. The majority of these have been concerned with plants, but investigations have also been carried

[1] See "Experiments with Wheat and Barley Hybrids illustrating Mendel's Laws of Heredity." Journal R.A.S.E., Vol. 65, 1904, pp. 337-345.

out with certain characters in the following animals : poultry, mice, rabbits, guinea-pigs, sheep, and horses. Indirect evidence has also been obtained from pigeons, canaries, snails, and silkworms. Even in the case of man himself it seems probable that certain characteristics can be shown to be inherited on Mendelian lines. Such a list is sufficient to show that these principles are of far-reaching consequence ; it is clear that they are going to prove of vast importance to the great breeding industry which has become so essential a part of our modern agriculture. The time has not yet come when cut and dried formulæ for breeding " to order " any particular type can be given ; but there is no reason why the breeder should not take into account the facts which have already accumulated and endeavour to utilise them in practice. If this is possible, and in my judgment there is no question of it, the value of such work will be almost inestimable. The simple statement that the stock of this country is valued at some four hundred and fifty million pounds[1] sterling is enough to make it obvious that even the slightest improvements must in the aggregate represent an enormous gain.

The improvement of stock has ever been the aim of our stock breeders. Thanks to their efforts our agriculture is now in a far sounder position than otherwise would have been the case, and we can still export the finest of live stock to all parts of the world at a profit to ourselves. The signs are not wanting, however, that the foreigner is gradually invading what has hitherto been one of our preserves, and it remains to be seen whether the ingrained experience of centuries in this sort of work will enable our agriculturists to retain the lead they have held so long. If the breeders will only add scientific methods to their extraordinary and almost instinctive knowledge of the features of first class stock, this position can be retained. It is in the hopes of giving some idea of how scientific methods can be employed in the raising of live stock that this article is written. It attempts to do no more than this, for the problems of the breeder are not to be solved except by specialists in each particular breed, who alone have the requisite knowledge to attempt such work profitably.

Experiments with different varieties of wheat.—The essential features of Mendel's discoveries can be readily illustrated by following out the results of crossing together varieties of wheat differing from one another in certain characteristics. For the sake of simplicity two varieties differing in one respect only will be first considered. These are chosen in preference to

[1] " The Breeding Industry : Its Value to the Country, and its Needs." By Walter Heape, M.A., F.R.S., page 73.

any experiments in the animal kingdom simply because large generations have been raised, and there can be no question about the statistics or the principles deduced from them. In the one variety the ears are lax; in the other they are dense

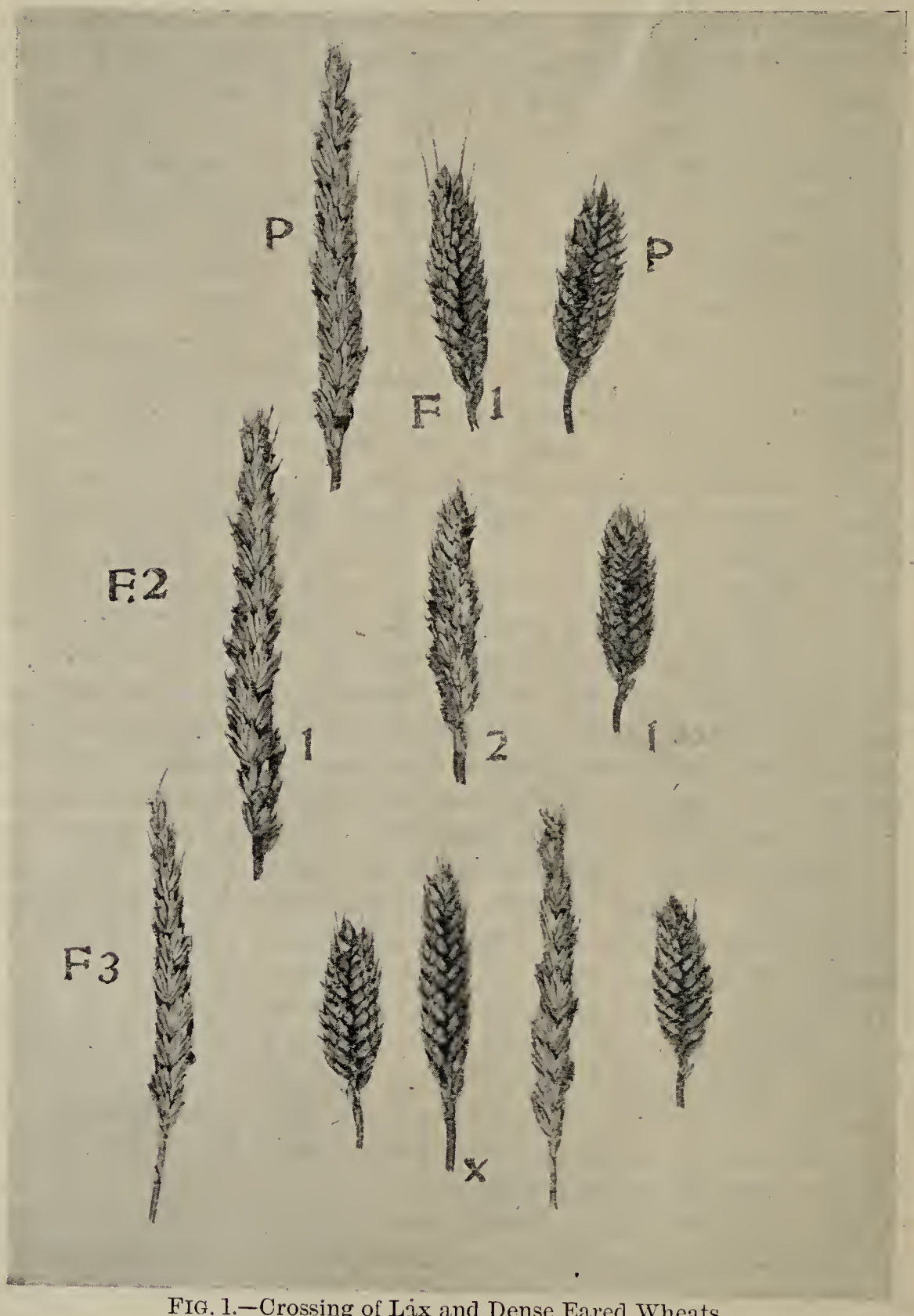


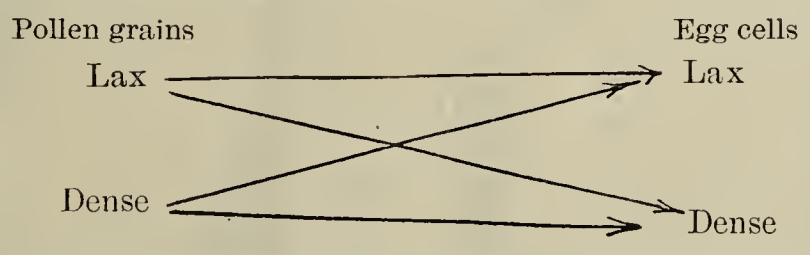
FIG. 1.—Crossing of Lax and Dense Eared Wheats.

or club-headed (Fig. 1, P). When these types were crossed together, a hybrid (F 1) was obtained with ears which were neither as lax as the one parent nor yet as dense as the other, so that in this respect the ears may be described as intermediate,

and for the sake of convenience this form of ear will be referred to subsequently as the intermediate type. The same form of ear was produced whether the club wheat was the male or female parent.

The grain of these plants when sown did not breed true to the intermediate shape, but produced individuals with lax, intermediate, and dense ears (Fig. 1, F 2). These plants occurred in the proportions of 1 : 2 : 1. The plants with lax ears were similar to the one parent, those with dense to the other, whilst the intermediates were similar to the plant produced as the result of the cross. No other types were found, although some thousands of plants were raised, so that crossing did not give rise to the miscellaneous progeny it is often supposed to and the types appearing showed the parental and hybrid characters only. On making trial sowings of these three types, the lax and dense were found to breed true to these characters, whilst the intermediate ears again split up, giving rise once more to plants with either lax, intermediate, or dense ears, in the proportion of 1 : 2 : 1 (Fig. 1, F 3). The plants with the ear shape characteristic of the actual cross-bred behave in the same fashion, then, as the cross-bred itself when a further generation is raised. Numerous similar crosses have been grown, and all of these have given identical results.

The explanation offered by the Mendelist is that the hybrid forms sex cells or gametes which carry the characters in a pure and not a blended condition. Some of its pollen grains and egg cells carry the dense character ; others, the lax ; these are produced in approximately equal proportions. On fertilisation, then, the chances of combination are :—



Where the gametes carrying the lax character meet, the resulting plant has lax ears ; similarly where dense meets dense, only a dense eared form can be produced ; but where lax and dense or dense and lax meet, then, as we know from the original cross, the progeny will have intermediate ears. No other combinations save these four are possible, a fact which accounts satisfactorily for the ratio of 1 : 2 : 1.

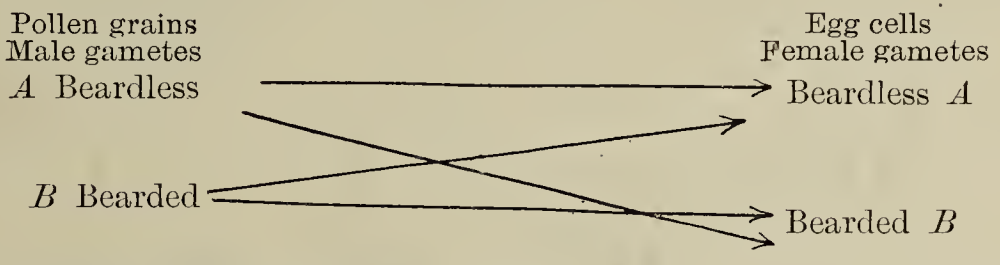
The cases which Mendel himself investigated are at first sight a little more complex than the one described here. The inheritance of the bearded and beardless characters in wheat is, however, of the same order as Mendel's cases with peas.

The two varieties (Fig. 2, P) chosen for this experiment were bearded and beardless, but otherwise similar. On crossing, a beardless hybrid was obtained which was as beardless

FIG. 2.—Crossing of Bearded and Beardless Wheats.

as the parent. In this case, then, there was no appearance of an intermediate form resulting in the production of a semi-bearded type as one might have expected from the example quoted previously. The reciprocal cross gave the same result. The hybrids, then, were similar to the beardless parent, and where that was chosen as the mother one might well have supposed that the cross had failed to take, and normal grain had been set. Mendel termed the character which appeared in the hybrid, to the exclusion of the other, "dominant," and its fellow "recessive." Using this terminology, the beardless condition is said to be dominant over the bearded, and the bearded recessive to the beardless.

On sowing the grains of the hybrid, they produced beardless and bearded offspring, three of the former being present to each of the latter. On the assumption that the hybrid produces gametes carrying either the beardless or the bearded character, this result is readily explained. The possible chances of combination are represented diagrammatically as before :—



They are AA, AB, BA, BB. Where A and A meet or B and B, the resulting plant will be beardless in the one case and bearded in the other. Where the unlike gametes A and B meet, as in the original cross, then they give rise to beardless plants, A being dominant over B.

If this explanation is correct, then two of the three beardless plants, namely AB and BA, should give a mixed progeny similar to that of the original hybrid, whilst the third, AA, though indistinguishable by eye, should breed true. The plant BB, showing the recessive character, should also breed true.

The succeeding generation (Fig. 2, F 3) showed that this was the case. On the average, two out of every three of the beardless plants (F 2) threw bearded as well as beardless individuals, whilst one bred true to type. All plants with beards, that is, the recessives, on the contrary, bred true.

The beardless plants which give a mixed progeny correspond with the intermediates of the previous case, but owing to the complete dominance of the one character they are inseparable as far as external appearances go.

Neither of these crosses has produced fresh types in a stable condition, but they supply the breeder with some essential facts which may be stated here and their application

followed out in a more complex case. This may be considered to be more or less typical of those which will be met with in practice.

In the first case the characters already existing in the parents are transferred in their full intensity to the fixable forms among the descendants of the hybrids. Where intermediates occur, these are incapable of breeding true to type, and they always throw off the types which produce them originally. Recessives breed true from the moment of their appearance among the offspring of the hybrids; but, on the average, only one in three of the individuals showing the dominant feature breeds true: the stable forms can only be distinguished by raising a further generation from them.

Where more than one pair of characters are present in the parents, new forms are produced by the recombination of these characters into fresh groupings. This is illustrated in the series in Fig. 3. One parent was a club wheat with a beard, the other had lax ears and no beard (Fig. 3, PP). There are thus two sets of units to be considered, namely, beards and no beards and lax and dense ear-shapes.

On crossing these varieties together, the hybrid obtained was beardless and intermediate with regard to the shape of the ear (Fig. 3, F 1). In spite of the fact that more than one pair of characters is present, the results are the same as before, the beardless condition being dominant and the meeting of the lax and dense giving intermediate. The offspring of the hybrid consisted of the following types:—

Bearded lax, beardless lax, bearded intermediates, beardless intermediates, bearded dense and beardless dense (Fig. 3, 1-6). These occurred in definite proportions, the lax, intermediate, and dense being present in the ratio of 1 : 2 : 1, whilst on the average there were three beardless to one bearded of each of these types.

No other types beyond these were produced, no entirely fresh features like, for instance, roughness of chaff making an appearance.

The data already obtained from an examination of the previous cases will show how the behaviour of each of these six types may be predicted when a further generation is raised from them, and incidentally it will show how the breeder will have to treat such cases in practice.

Beginning with the intermediate types our previous experience would indicate that they would break in the next generation into lax and dense (Fig. 1). On sowing, it is found that both the bearded and the beardless forms break in this way, so that it is policy to throw out all these intermediates at once, as fixity of type should be essential in all breeds.

Both the lax and dense forms, whether bearded or beardless, will, however, breed true to the lax or dense type of ear (Fig. 1), so that it only remains to determine whether they will breed true to the bearded and beardless characters.

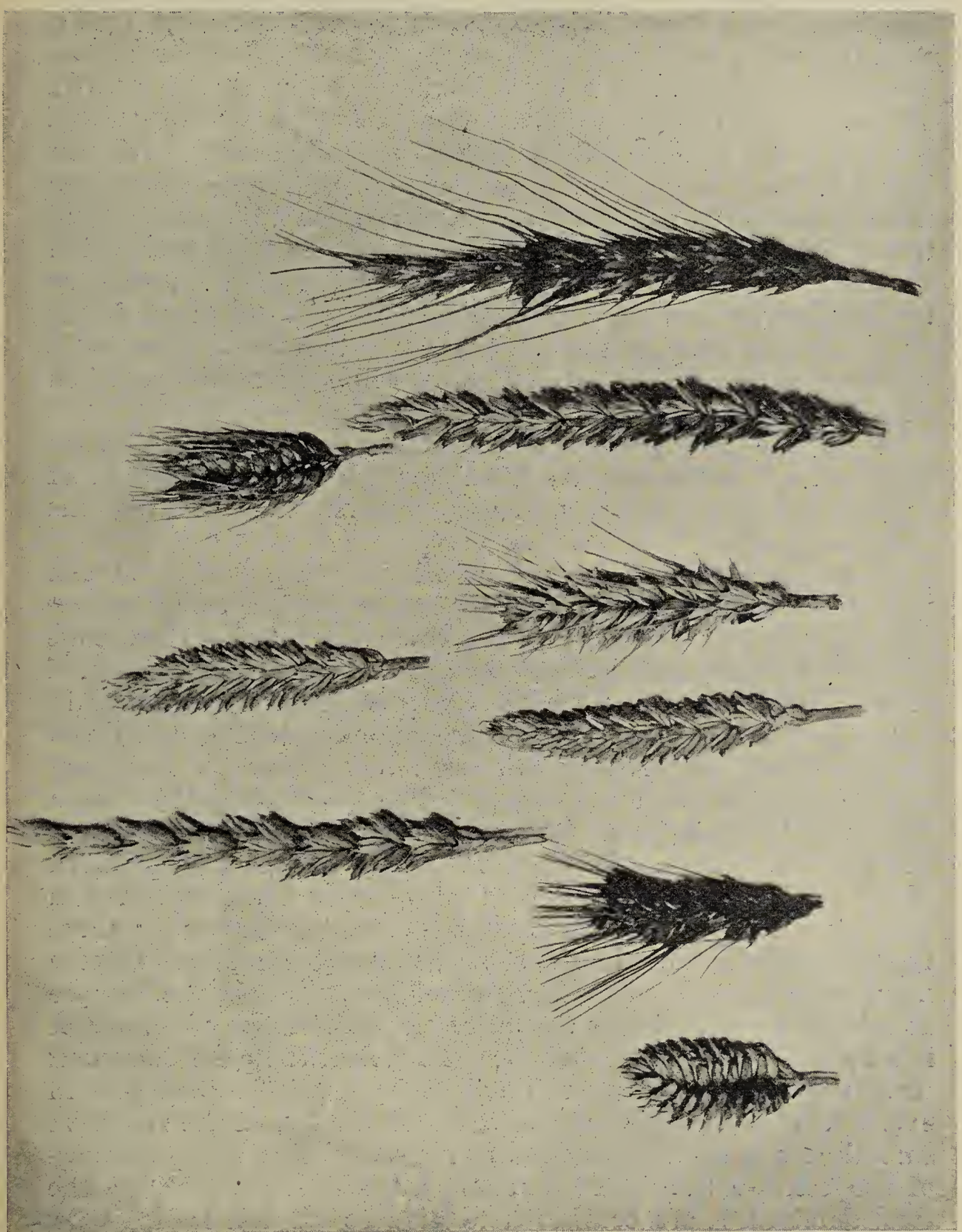


FIG. 3.—Crossing of Wheats with two pairs of characters (Bearded Dense and Beardless Lax).

The beardless condition of the first cross and the fact that there are on the average three beardless to one bearded individual indicates that beards are recessive to no beards

(Fig. 2). The recessive characters invariably breed true to type from the moment of their appearance among the descendants of the original cross-breds, so that every bearded individual will breed true to this character. The combination of beards and laxness or similarly of beards and denseness should therefore breed true. Repeated tests have shown that this is actually the case. Stable races of each of these forms can therefore be isolated in the generation bred from the hybrid. The two other types to be considered are the beardless lax and dense-eared. The beardless condition is dominant over the bearded, and consequently one cannot distinguish between those beardless individuals which are pure in this respect and those which will throw off recessives when a further generation is raised from them. To isolate the pure types it is necessary to sow a series and determine which produce beardless forms only. On the average the pure beardless form will occur once in every three trials. All future sowings of this type when isolated will remain pure.

Both the recessives and the dominants in combination with lax or dense ears can then be isolated, the problem of finding the pure recessive being simpler than finding the pure dominant.

Such cases as the one just described will probably be met with frequently by the breeder. A slightly more complex case was discussed theoretically in the Journal (Vol. 65, 1904, page 342), which may here be referred to from the practical point of view. In this case the parents differed from one another in two pairs of characters : rough and smooth chaff and red and white colour. Of these, roughness and redness are dominant over smoothness and whiteness. The generation bred from the hybrid consisted of four types : rough red, rough white, smooth red, and smooth white in the approximate proportions of 9 : 3 : 3 : 1. The smooth and white types being recessive in both characters bred true from the first, but the other three types involving combinations of dominant characters offer a more complex problem. The smooth red, for instance, is pure as far as the smoothness goes, but the redness may be pure or it may mask a recessive white. To isolate the pure dominant form the same breeding test has to be applied, when one in every three will breed true to the combination of the recessive smoothness with the dominant redness. The same is true of the combination of roughness and whiteness. Where the two dominants are combined to give rough red individuals, the stable form is more difficult to distinguish. As already indicated one in three of the reds will breed true and one in three of the rough chaffed, so that the chance of finding the pair combined in the pure form is only one in nine. To

obtain this combination in the stable condition it is therefore necessary to test a far larger series of individuals than was the case where only one dominant feature had to be considered.

The combination of two dominants from the animal breeder's point of view means a long series of tests which may prove almost prohibitive in practice.

Crossing of Suffolk and Dorset Horned Sheep. — The inheritance of numerous characters in the animal world has been traced in the same manner as those just described. Thus the inheritance of the face colour and horns in sheep has been investigated by Wood.[1] The breeds chosen for this purpose were Suffolks and Dorsets, the former having black faces and no horns, the latter white faces and horns in both sexes.

Thirty Suffolk ewes, crossed with a Dorset ram, gave forty-three lambs, all of which had speckled faces, the black and white being distributed in patches. The cross was also made in the opposite direction, Dorset ewes being mated with a Suffolk ram. In this case also all of the offspring had the same type of speckled face (Figs. 4 and 5). The direction of the cross, then, makes no difference in the progeny. This may be taken as a general rule, and the breeder need not look for males carrying the character he requires with the idea that they will prove the more prepotent. The faces of the hybrid sheep being neither pure black nor white, like those of the parents, but a mixture of the two, must be described as intermediate, neither black nor white being dominant. Thus the inheritance of this pair of characters reminds one of the inheritance of the lax and dense ears in wheat.

The next step was to breed from these hybrids. A Suffolk-Dorset ram was saved, and crossed with a number of females of the same descent. Unfortunately, the animals were young to breed from, and only a small number of lambs was secured. Five of these had pure white faces, two speckled, and one black. The numbers are too small to indicate what proportion of each type would occur in a large flock of this descent, but small as they are, they show that the result of mating together the hybrids is to produce once more the characters seen in the parents, together with further hybrid, that is, speckled faced, individuals. If we may judge from analogy, and it seems safe to do so in this case, it would be hopeless to attempt to obtain a pure race of these speckled faced sheep by mating black and white; each year they would simply throw half as many black or white faced individuals as speckled.

Turning now to the inheritance of horns, in both the sets of hybrids the animals were horned if males, and hornless if females—a curiously interesting result not without a bearing

[1] Wood, Journal of Agricultural Science, Vol. I., page 364.

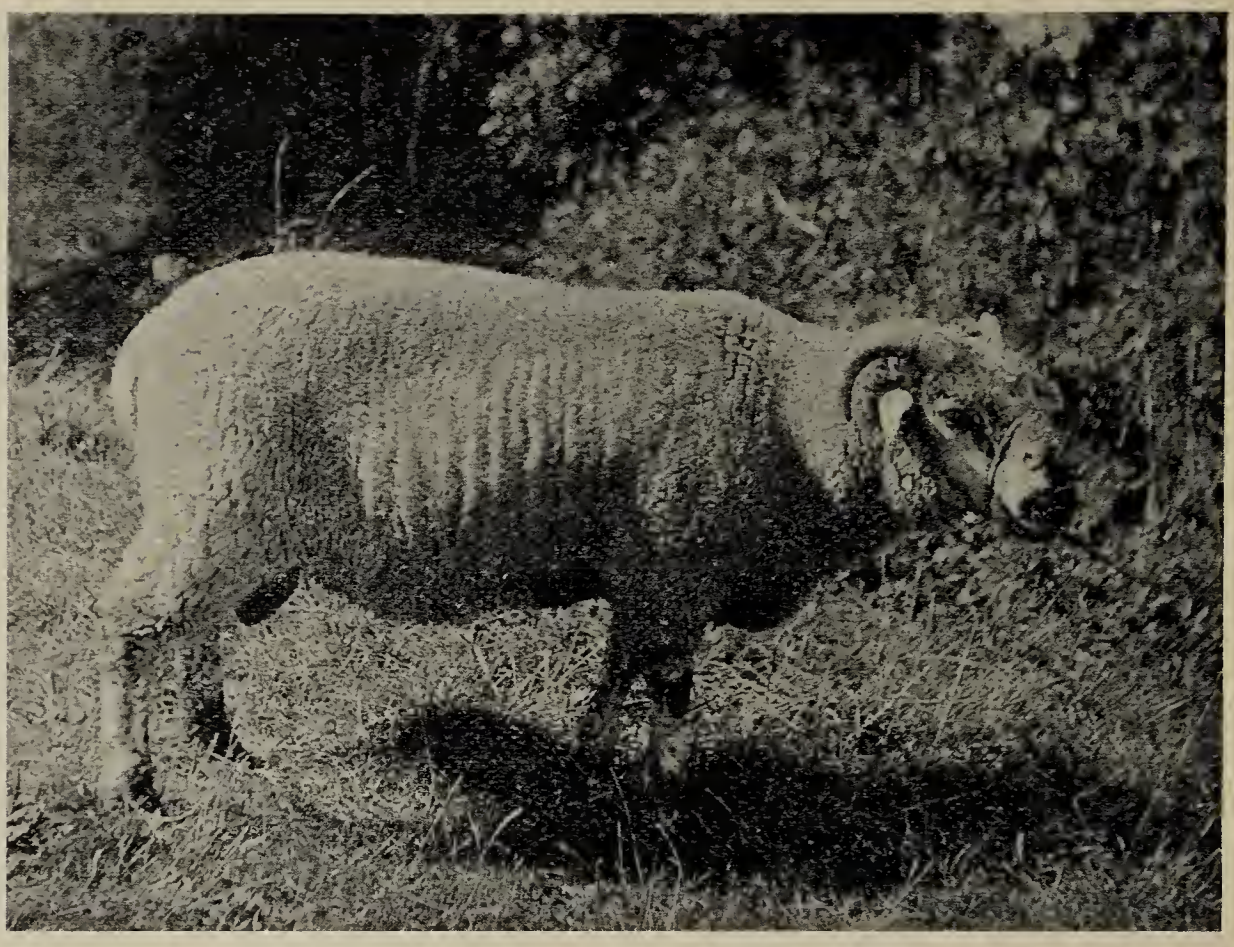


Fig. 4.—Result of crossing Suffolk and Dorset Horned Sheep.

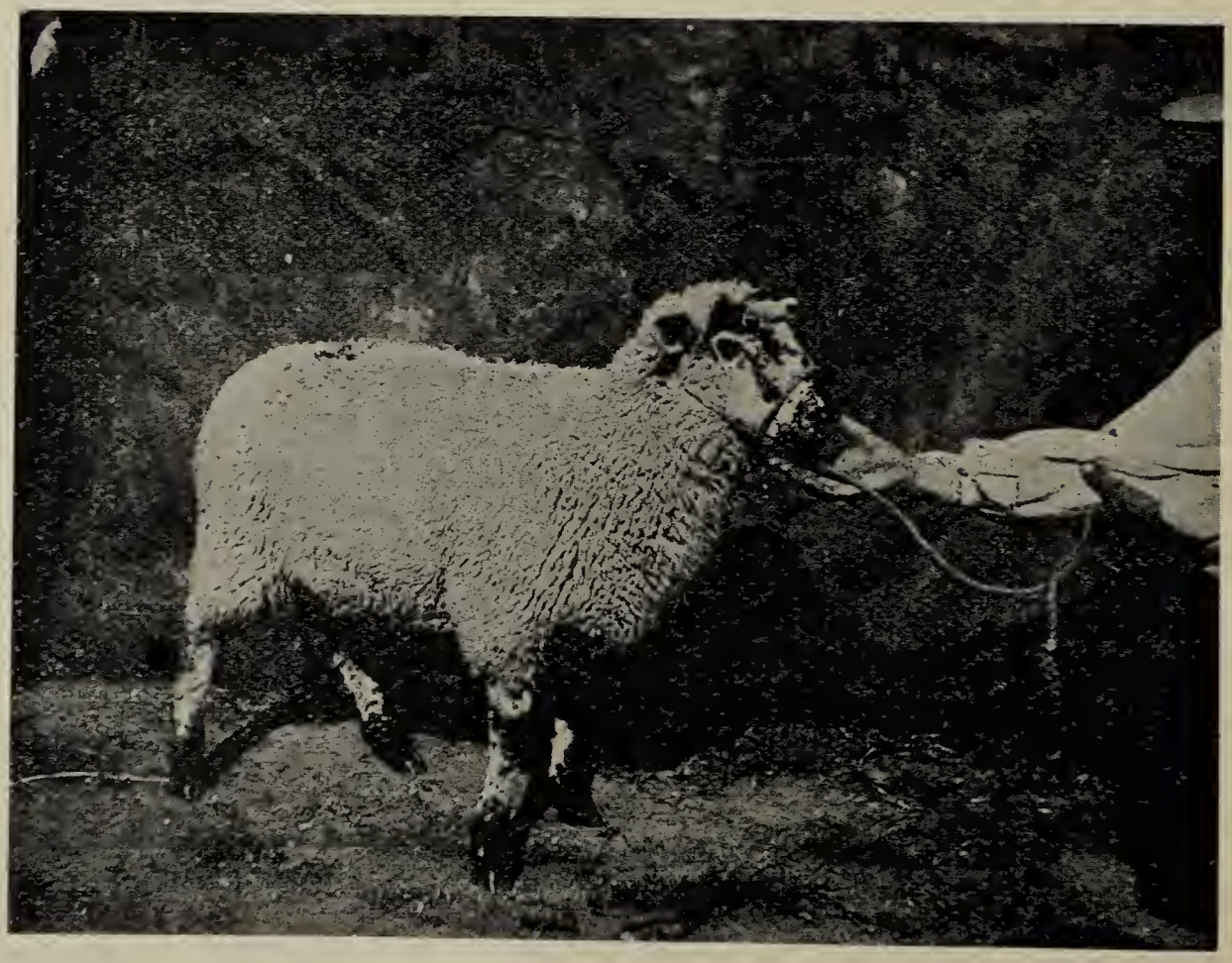


Fig. 5.—Result of crossing Dorset Horned and Suffolk Sheep.

on the problem of the segregation of sex.[1] On crossing together the hybrids, then, as far as the horned character goes, the mating was similar to that originally made between the Suffolks and Dorsets, but the result was singularly different, for both horned and hornless rams and horned and hornless ewes were produced.

So far we have considered each of these character-pairs separately, confining attention to either the coat colour or the horns. Taking them together we find that the black or white or speckled individuals may be horned or hornless. These characters have thus entered into a new series of combinations. In the parent, white faces were associated with horns, but among the descendants of the hybrid are black faced individuals with horns; similarly, the white face of the Dorset type appears without horns. Were there any point in fixing these new breeds, it would probably prove an easy matter, for either white or black faces would in all probability breed true at once to these characters, and attention would have to be directed only to the horns.

In this case, the fact that the hybrid male is horned and the female is hornless introduces a complication which has not yet been investigated. To test the purity of the forms appearing in the generation raised from the cross-breds, a further breeding test would be necessary. Crossing the hornless types with the pure Suffolk would, if the type was fixed, give nothing but hornless offspring, whilst if impure, horned individuals, as well as hornless, would result. Similarly, the horned types, if crossed with the Dorset, should always produce horned offspring if pure, or horned and hornless if unfixed with regard to this feature.

Shorthorn-Aberdeen Angus Cross. — In cattle, the polled condition appears to be dominant over the horned, since in crosses between Shorthorns and the polled Aberdeen Angus, the resulting animals of either sex are polled or at the most bear small scurs in place of horns. Similarly the black colour of the Aberdeen Angus is dominant over the red of Shorthorns, whilst white appears to be recessive to the latter.[2]

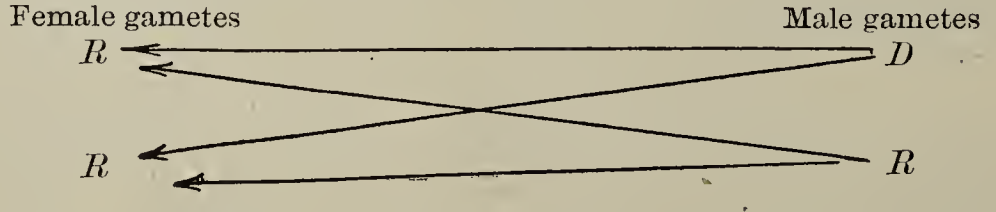
Inheritance of Colour in Horses. — Actual experiments planned to trace the inheritance of the various characteristics have not yet been carried out, and in view of the cost such a research would entail, it is not likely that they will be for many years. Nevertheless data of the clearest kind are not wanting here, and the story of the inheritance of the chestnut colour of the coat is known with certainty. The facts have

[1] From information received from Sir John Thorold, it appears that crosses between Galloways and Shorthorns are horned if males, and hornless if females.

[2] Cameron, Live Stock Journal, December 28th, 1906.

been traced by Hurst from a careful analysis of the records given in Weatherby's *General Stud Book of Race Horses.*[1] In this great work the parentage, sex, and coat colour of all British thoroughbreds is given, and the records appear to have been kept with unusual care. From the data given there it is clear that chestnut colour is recessive to bay and brown, and consequently wherever one of these latter colours is mated with chestnut the offspring is bay or brown. By way of example, St. Simon, St. Serf, Galopin, Ladas, Merry Hampton, and Cabin Boy, all either bay or brown animals, have given 370 foals when mated with chestnut mares, and without exception these have proved to be bay or brown. In this group of sires each was pure with regard to the colour of the coat. As is only to be expected, though some sires were not so, a bay or brown resulting directly from a cross with a chestnut would not be pure, for instance, though one could not detect this without actually breeding from it. There is in this case no mark of the hybrid to correspond with the speckling of the face of the hybrid black and white faced sheep. Hurst has picked out a series of these cases and shown that twelve such sires, when mated with chestnut mares, have produced an approximately equal number of bay or brown and chestnut foals. The actual figures are 355 and 347. A typical case is afforded by Isinglass, one of whose parents was a chestnut. Mated with chestnuts he gave 62 foals, 28 of which were bay or brown and 34 chestnut. These figures are a sufficiently near approach to equality where comparatively small numbers are concerned.

Calling bay or brown *D* and chestnut *R*, the sires in these cases are *DR*, and they produce both *D* and *R* gametes in equal proportions. The chances of combination may be represented as follows :—



giving *DR* or *RR* in equal proportions. As bay or brown is dominant over chestnut the *DR*'s will appear to be pure bay or brown. As chestnut is recessive to these colours when mated with chestnut, no matter what the descent, it must give chestnut. Hurst illustrates this point by an analysis of 100 chestnut sires of various extraction mated with some 600 chestnut mares again of varied descent. These gave a total of 1,104 recorded foals, of which 1,095 are entered as chestnut. In

[1] Proc. Roy. Soc., Vol. 77, page 390.

other words, over 99 per cent. were true to type. The remaining nine recorded as bay or brown are doubtless errors in the record, and it is interesting to note in this connection that further records of some of these same animals in the Racing Calendar give them as chestnut.

A further series of records given in the *Landwirthschaftliche Jahrbücher* for 1888 by Crampe, and again by Wilckens, shows that chestnuts of any descent when bred together give nothing but chestnut in their offspring.

Crossing of Poultry.—Owing to the fact that large numbers can be raised at a comparatively small cost, poultry have provided very suitable material for the study of heredity. From the researches of Bateson and Hurst[1] it is now possible to trace in considerable detail the inheritance of most of the features characteristic of the various breeds. One case of exceptional interest is afforded by a study of the Blue Andalusian fowls. This "breed" proves to be a typical example of an unfixable first cross or *DR*. If, for instance, show birds are bred together, they do not produce simply Blue Andalusians, but three distinct types: white splashed, black, and some resembling the parent type. In an actual experiment of this sort the progeny consisted of 41 white splashed, 78 blue and 39 black birds, that is, they occur in the ratio of 1 : 2 : 1. One would expect from this that the whites and blacks would breed true to these characters, and further trials have shown that each type mated with its own colour breeds true. Further, if blacks and whites are mated, the resulting offspring are Blue Andalusians. To secure specimens of this breed, then, it would be policy to breed from the "wasters." All the resulting birds would then be Blue Andalusians, whilst if Blue Andalusians were bred from, the result would be that one-half only would reproduce the type.

Turning to other colours, the white of the Leghorns is dominant over colour in the Houdans, Hamburghs, and Cochins, but the dominance is not complete, as flecking occurs in the feathers of the cross-bred birds.[2] In the same way the black of the Houdans and Hamburghs is dominant over buff in the Cochins.

The comb characters have also been investigated in great detail. The single comb of the Cochins or Leghorns is recessive to the leaf comb of the Houdans, whilst the rose comb of the Hamburghs is dominant over the same singles and over leaf combs. In the generation bred from the hybrids in each case the two types appear in approximately the ratio of three to one.

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[1] Report to the Evolution Committee of the Royal Soc., Parts I., II. and III.

[2] There is evidence to show that white may be of two sorts—one recessive to colour, the other dominant. Evol. Report Roy. Soc., Part III., page 18. Davenport, Inheritance in Poultry, Washington, 1906.

Amongst the other characters which have been investigated is that of broodiness, and according to Hurst non-sitters, when crossed with sitters, give in the first generation all good sitters.

From the studies made with other subjects such as mice, rats, rabbits,[1] and guinea-pigs many other examples to illustrate the same phenomena might be quoted. It must not be assumed, though, that because the cases chosen for description are all simple no complications occur, for undoubtedly they do. These complications always appear, however, to be capable of analysis if only the investigations are made on the right lines, and where such investigations have been made they serve to increase one's confidence in the wide applicability of Mendel's Laws.

All of the characters quoted are more or less obvious ones, and the question might be raised as to whether the same laws will hold for such intangible characteristics as, say, docility, yield of milk, quality of flesh, and so on. The answer is that in all probability they do. Bateson, for instance, after making most comprehensive investigations on heredity in poultry writes: "There is no reasonable doubt that such features as late or early feathering, shortness of wing quills and tails, peculiar qualities of voice, forms of constitutional weakness follow rules closely similar to those detected in features more amenable to critical study."

The inheritance of those characters with which the practical breeder will for the most part be concerned is beyond the reach of the scientist, who rarely has the opportunity of carrying out extended observations of this kind, still more rarely perhaps has any interest in those features which go to the making up of first class stock. Under these circumstances all advance in this particular direction must come from the breeder, and he will largely have to work out his own salvation. He alone has all the requisite material to hand and is in a position to carry out a sufficiently large number of experiments.

The chief points to which attention must be paid by any one attempting to carry out work of this kind may shortly be described here. In the first case, he must become familiar with the conception that the animal is built up of a series of units or characters, the inheritance of which may be traced independently of one another. This offers a certain amount of difficulty to those in the habit of judging animals as a whole, but this will disappear if such an example as that illustrated in Fig. 3 is worked through in detail. Each of the characteristics of the two parents should be recorded carefully, and their inheritance observed in the cross-breds. As a general

[1] Hurst, Journ. Linn. Soc. Zoology, Vol. XXIX., page 283.

rule it will be advisable not to attempt to work with too many characters at a time, as this tends to complicate the experiments considerably. Where practicable, two pairs only should be chosen, as this will limit the numbers to be raised from the cross-breds to reasonable dimensions.

The data obtained from the first crosses will as a general rule be sufficient to determine whether one of a given pair is dominant or recessive, or whether the result of their union is to give an intermediate. A third possibility that the cross-bred may show a reversionary form is not considered here, as such cases appear to be rare amongst animals in which the breeder will have any interest. The next step is to mate together the cross-breds. Many breeders will feel that this is a mistaken policy, for the idea is prevalent that the offspring of such a mating is degenerate.

This is doubtless due to the fact that among the offspring, particularly where the parents differ in numerous characters, many types appear, and this has been taken as an expression of the fact that the original types have been hopelessly broken up—a matter of regret in the days when pedigree was far more important than Mendelists now consider it to be. Nevertheless, as it is in this generation that the sorting out and the recombination of the characters present in the original parents occurs, this mating is essential. As large a number of cross-breds as practicable should be used in order to obtain a sufficient number of animals to choose from. Thus, if two pairs of characters are under consideration, on an average the four possible combinations in a stable form will only occur amongst sixteen animals, and this number must be more than doubled in order to secure males and females of each type to test the purity and establish the breed. The animals not considered desirable should be disposed of, and those chosen for further testing should be examined character by character. A comparison with the experiment described in Fig. 3, or the case following it, will at this stage help to show the chances of obtaining the type in a fixed condition. If it shows a combination of two recessives, then, mated with its like, it will breed true. If a recessive and an intermediate, it will be fixed as regards one feature, the recessive, but when bred with its like it will throw intermediates, together with the characters as seen in the parents. For instance, in the case of the sheep-breeding experiment, if we assume that two of the animals are pure as far as the horned character goes, but have speckled faces, these, if bred together, would give in their offspring horned black, white, and speckled faced individuals, and pure races with black or white faces could be bred from these, but not a race with speckled faces.

Where a dominant and a recessive character belonging to different pairs are in combination, then it is a two to one chance that any given animal is pure with regard to the dominant character, and the only method of discriminating in such cases is to test by further breeding. This becomes a serious matter, for to ensure picking a pure male and a pure female, on the average nine matings must be made. Unfortunately there seems no possibility of this further breeding test being avoided, though it may be simplified by crossing the types to be isolated with a pure recessive. If the type is pure, all the offspring will show the dominant character ; if not, half will show the corresponding recessive. If the pairs of characters are *Aa* and *Bb*, such an animal may be *Ab*, the pure, or *Aab*, the impure, type.[1] On crossing with an animal such as the parent showing the recessive in question, *a*, in the former case, *Ab* on meeting *a* will give all *Aab* ; in the latter, where two types of gametes *Ab* and *ab*, are being produced, it will give *Aab* and *ab* in equal proportions. The pure types, when isolated, form the starting point of a new breed.

Finally, the case has to be considered where two pairs of dominant characters are combined. On the average this occurs nine times in every sixteen individuals in the generation bred from the cross-bred. These animals all appear to be similar, yet constitutionally they fall into four types. Using the same notation, *Aa* and *Bb*, for the pairs of characters, such animals may be *AB*, *AaB*, *ABb* or *AaBb*. The type which will breed true when mated with its like is the one in which both dominant characters are pure, namely *AB*. This only occurs once in every nine individuals. As one would require a pure male and female to start such a breed, it is evident that the chances of drawing both are too remote for practical purposes. If such a combination had to be effected and the type fixed the simplest plan would be to take animals showing both recessive characters, *ab*'s, from the generation bred from the cross-breds and mate these with the series having the appearance of *AB*'s. The pure type would then throw only animals similar to itself (*AaBb* resembling *AB*). On the average this would mean nine matings to find a single pure type, and in the case of animals which give but one descendant a year this would have to be continued for at least three years before one could be reasonably sure of its purity. Once a pair of such animals have been isolated the

[1] This combination occurs three times on the average in sixteen individuals. See Journal R.A.S.E., Vol. 65, 1904, pp. 337-345. The corresponding combination *aBb* or *aB*, where *a* is recessive and *B* dominant, occurs in the same proportion, and the pure type may be distinguished in the same fashion by crossing with an animal showing the recessive *b*.

type would remain pure. It is questionable, though, how far it would be practicable to make such a combination in the case of the larger animals, though theoretically there is no difficulty about it. Where, however, a number of offspring are produced annually one season's testing would be sufficient to determine the purity.

From the foregoing account it will be seen that breeding has entered upon a definite stage, and that order can be traced in a subject which hitherto has appeared to be chaotic. The breeder has now to recognise that new breeds can be built up with certainty by recombining characters already existing in other breeds, and improvements in type will result from picking out a desirable feature here, another there, and so on, and combining them together. These characters are handed on in their full intensity, and as far as it can be determined there is no possibility of definitely diminishing or intensifying any character by breeding. The intermediates which result from certain combinations which might at first sight appear to contradict this statement are unstable. In some few cases evidence has been found which shows that characters are sometimes coupled together in some way and are incapable of being separated on crossing, but this phenomenon does not appear to be a general one, and at present it cannot be discussed in detail.

Whether any fresh features not already existing in the parents will ever appear among the descendants of cross-bred animals is still a matter for future experiments to decide. Indications that such may be the case have been found, and though unexpected at first, Mendelian explanations of their occurrence are not wanting. In this direction, then, there is still the chance which always appeals to the breeder of producing a type totally distinct from the forms he set out with.

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PARASITES OF CATTLE AND SHEEP.

SUMMARY OF CONTENTS.

	PAGE
Introduction	64
External Parasites of Cattle	65
Flies	65
Ox Warble Fly	65
Lice	68
Scabies or Mange Mites	69
Ticks	71
Ringworm Fungus	73
Internal Parasites of Cattle	74
Stongyles of Parasitic Gastritis	74
Tapeworms	77
Liver Fluke	78
Strongyles of Hoose, Husk, or Parasitic Bronchitis	78
External Parasites of Sheep	80
The Maggot, Fly, or Worm	80
Lice	80
Ked	81
Sheep Scab	82
Mange Mites	86
Ticks	86
Scarlet Mite or Harvest Bug	87
Internal Parasites of Sheep.	87
Sheep Warble or Bot Fly	87
Parasitic Gastritis	88
Liver Fluke	92
Parasitic Bronchitis	95
Parasitic Pneumonia	95
Gid, or Sturdy, Hydatid	96

THE importance of parasitic diseases of cattle and sheep to the stock owner can scarcely be over-estimated, for, in the absence of the majority of destructive plague-like maladies scheduled under the Diseases of Animals Acts, such are probably the cause of more serious loss than all others, while scientific research and common observation have, of late, added considerably to our information concerning them. This recently acquired knowledge has tended to give the impression that parasitic disease is more prevalent than formerly. There are no sure grounds on which to form an opinion on this point; but it is certain that the category is swollen by the newly attained power of placing diseases in proper relation to their several causes. In the past it was the fashion to name an ailment after its most prominent symptom; at present it is customary to associate cause and effect. For instance, "husk" of the older school we term "parasitic bronchitis"; formerly "diarrhœa" was regarded as a disease, and the name, or its more familiar equivalent, "scour," was applied to conditions in which it was a prominent symptom; now we speak of it in relation to its cause, under the heads of "parasitic gastritis," &c.

In considering the adoption of measures to lessen losses from parasitic attack, those of a preventive nature will be found of greatest value. In cases of internal affections, it is often beyond our power to do much good after disease is established. The greatest importance attaches therefore to a knowledge of the conditions essential to the life and development of parasites both within and without the host

In this article it is proposed to describe the more important facts concerning some of the parasites of cattle and sheep most commonly met with in Great Britain, dividing the subject into external and internal parasites of cattle and of sheep, and giving in each case the treatment recommended.

External Parasites of Cattle.

The external parasites usually produce their effects by local irritation, while the diseased condition of the skin is often mainly the result of self-inflicted injury, caused by the host in attempting to rid itself of the irritant. Parasites which pierce the skin may, however, produce sores, or be the carriers of disease germs and the means of propagating serious systemic or local conditions, in addition to the irritation associated with their puncture.

Flies.—All insects have six legs and jointed bodies; the class includes the Diptera or two-winged insects, commonly, though not always correctly, called "flies." In the perfect state, flies are temporary parasites; some only bite the skin, and give rise to sores, which are aggravated by the attempts of the animal to dislodge its unwelcome guests; others, not truly parasitic, may merely convey infective matter, with which they have become soiled from contact with diseased parts, but may thus be important factors in spreading contagious disease.

Of the biting "flies," cattle are sometimes attacked by the breeze or gad fly (*Tabanus*),—resident in woods and pastures, and which in its flight makes a buzzing noise—the forest fly (*Hippobosca*), the cleg or grey fly (*Stomoxys*), and the gnat (*Culex*). These, and probably flies of other species, when, as during the past summer, circumstances favour their existence, may annoy, cause unrest, and occasion loss of flesh and milk, to which self-inflicted injury is often added. The legs of cattle appear to be more generally affected by flies of this class, which are found more commonly in certain districts than others. On rare occasions, the small blinding breeze fly (*Chrysops*), which specially attacks the eyelids, may induce extensive inflammation, leading to temporary blindness.

The means at our disposal for preventing the attack of such flies are referred to under the next section (Ox Warble or Bot Fly).

Ox Warble or Bot Fly.—Of all parasitic diseases of the skin, probably none is more familiar than that usually referred to as "Warbles." It is well known that the lumps, which are perceived in the skins of cattle from January to May, contain the larvæ or maggots developed from eggs deposited on the skin or hairs in summer by a fly. For many years, it has

been taken for granted that the fly which deposits the eggs on the skin or hairs is the ox warble or bot fly (*Hypoderma bovis*), (Fig. 1), and that the eggs gain access to the depths of the skin at the spot in which they are inserted or deposited. The softness and non-resisting character of the egg-depositing tube has always proved more or less an obstacle to the acceptance of that view of the entrance of the parasite into the skin. Recently the view has been advanced that another fly, the *Hypoderma lineata*, or American Heel Fly, deposits its eggs on the hairs, particularly of the legs of cattle ; that these eggs, or larvæ developed from them, are licked off by the animal, pass into the gullet, which they pierce, and in this indirect way reach the skin. Fortunately, neither of these questions need affect the stock owner, whose object is to avoid their occurrence in his cattle. The maggots appear from January to May in the skin, and here they are found with the tail end, in which is the breathing pore, at the perforation at the summit of the warble. The number of warbles in the skin of individual animals varies widely ; in some, only a single specimen may be found, while hundreds may reside in a superficial foot of hide. A few warbles cause little inconvenience to their host, but when very numerous, great discomfort, local injury, and loss of flesh may ensue, and under any circumstances, the unbidden guest cannot be welcome. It is, however, to the hide that the greatest damage is done ; a few warbles may spoil a large portion, while many will render it practically useless.[1] The losses on account of warbled hides are stated to amount in the aggregate to several millions of pounds annually ; while, when the warbles are numerous, considerable portions of beef may be unfit for sale. Underneath the skin containing warbles there is found a somewhat jelly-like substance, which has a very dirty nauseating appearance. Flesh so affected is termed "licked beef." When considering the effects of this fly, we must take into account the unrest, sometimes amounting to "panic," the consequent loss of flesh and milk, and other possible injury to the in-calf cow, attributed to the apparent terror of animals while the eggs are being deposited. During this act, the warble fly is credited with producing a buzzing sound, hovering over the animal, making a sudden dart on to the skin, leaving an egg, and repeating the operation many times. As there is still wanting proof that the warble fly possesses any weapon with which the skin may be hurt, we think it probable that any

FIG. 1.—The Ox Warble Fly (*Hypoderma bovis*).

[1] See also page 207 of this Volume.

terror experienced may be associated with the buzzing of the breeze or other flies which bite.

Prevention.—When the warble is noticeable in the skin, the injury to the hide is done. Our attention should therefore be specially directed to the adoption of measures for preventing the fly from depositing eggs. As there is reason for believing that the warble fly lays its eggs only in bright warm sunshine, and avoids shade and water, the shade of trees, sheds, &c., should be accessible to the cattle, and, where practicable, water to stand in during the hottest parts of the day. The application of certain dressings to the skin from the beginning of May to the middle of September is of great service in deterring the fly from depositing eggs. Of such dressings there are many available. Few flies will alight on the skin which has lately been treated with paraffin, or paraffin and grease; but the effect is not enduring, and repeated applications must be made, while there is a degree of danger connected with extensive use of this agent. Stockholm tar is probably the most enduring, and the application is necessary only three or four times during the summer. Monthly dressings with a mixture of half a pint of oil of tar, a pound of flowers of sulphur, and a gallon of train oil, have been successfully employed for many years, and probably nothing is safer and better.

It has been the common practice to dress only the back and upper parts of the body, but in view of the known habits of *Hypoderma lineata*, and doubt about those of *Hypoderma bovis*, it is well to include the legs. When the warble is noticed in the skin (from January or February till May), the maggots should, when practicable, be squeezed out and destroyed by squashing or burning. If a little paraffin, pickling brine, or mercury ointment be applied to the warble a few hours before, the maggots are squeezed out more easily. When very numerous, the parts may be smeared with grease or mercury ointment, but with the latter great care is required, and a small quantity only must be used, and only a small part of the skin dressed at one time. It is stated by more than one authority that, naturally, the maggot leaves the skin only in the early hours of the morning, and it is advised in severe infestations of animals to place them in the house at night, and sweep up and destroy all maggots on the floors.

As it is probable that winter residence in the skin or tissues of cattle is absolutely essential, if all the maggots in the cattle of a district were destroyed, infestation in the coming season would to a large extent be averted. Indeed this special condition in the life-history of the bot fly suggests that concerted action might annihilate the species in this country.

Lice.—These parasites, which induce lousiness, pediculosis or phthiriasis, are wingless insects. They are permanent parasites, small, but visible to the naked eye, about one-eighth of an inch long, of a dull white or greyish colour, possessed of hooklets for holding on and a mouth for pricking. They are usually found lying flat on the surface of the skin, and though there is no disposition to leave the host, this is often effected by rubbing, &c. The pear-shaped eggs or nits become attached to the hairs and contain the young living parasites, which quickly come to maturity. Lice found on cattle belong to either of two families: the *Hæmatopinus* (Fig. 2), which sucks the blood of the host, or the *Trichodectes* (Fig. 3), which lives on skin products and dirt. The ox may harbour two

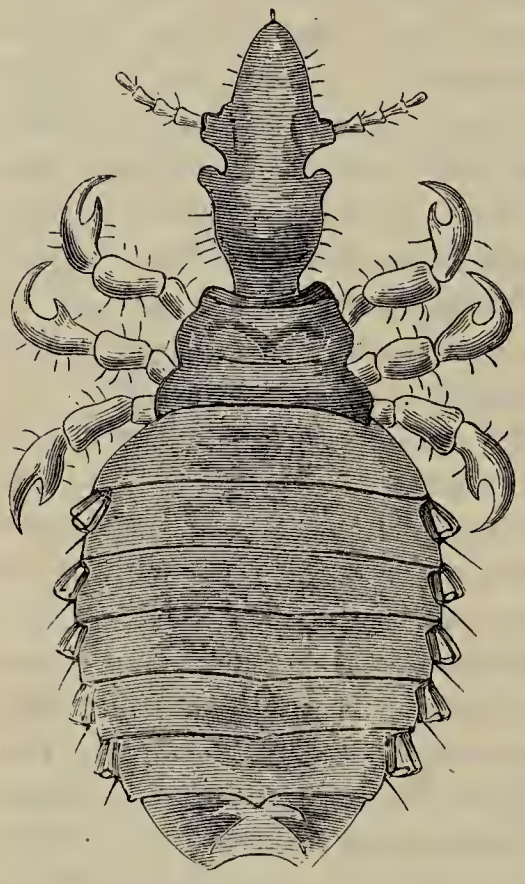

FIG. 2.—*Hæmatopinus* (magnified).

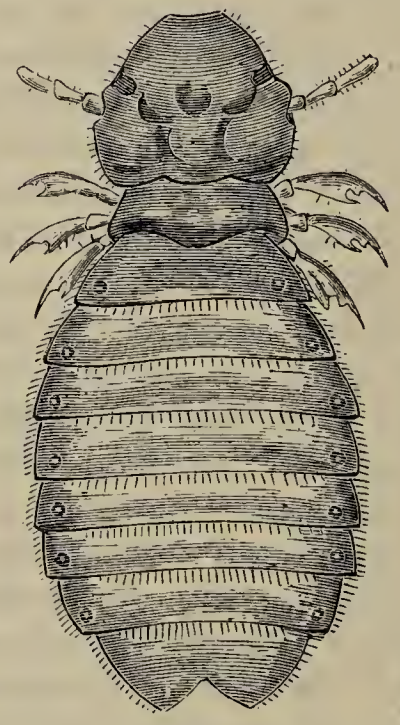

FIG. 3.—*Trichodectes bovis* (magnified).

varieties of the former and one of the latter. Young animals are more commonly affected, and one parasite, the *Hæmatopinus vituli* seems specially to favour sucking calves. Lice tend to spread all over the body, and are usually associated with a dirty condition of the skin and a low state of flesh.

The one species by biting, and both by crawling about, induce irritation, and consequent attempts on the part of the bearers to rub themselves. The coat is thus often broken, and sometimes large patches are denuded of hair.

Treatment.—Due regard for cleanliness, a liberal diet, and keeping apart from infested animals and places recently occupied by them, constitute the preventive treatment. The cure

is readily effected by thorough washing with soft soap and water, and, after scraping dry, the application over the whole body of any reliable mange dressing twice in a fortnight. Good food facilitates the cure. Litter should be burnt and places disinfected.

Scabies or Mange.—Scabies or mange (*Psoric acariasis*) may result from the attack of either of three varieties of acarus or mange mite, and is named accordingly, sarcoptic, psoroptic, or symbiotic. The two last forms are usually regarded as more common in cattle. Acari are all minute, and none are readily distinguishable with the naked eye. All mature mange mites have four pairs of legs, and the thorax and body are continuous and unjointed, and their heads are adapted for pricking or piercing the skin. These parasites live, breed, and develop on the skin, and have no tendency to leave it of their own accord. They are, however, sometimes rubbed on to posts, hurdles, &c., and may live away from the animal for some time, probably about two or three weeks. Their power to injure depends on the rapidity with which they multiply. Some idea of the rate of increase may be formed from the statement of an authority on the subject, that one pair of acari may in three months produce 1,000,000 females and 500,000 males.

Mange or scabies is common to all domesticated animals. The disease is, as far as is known, not commonly transmitted from animals of one species to those of another species. Each mange parasite flourishes best on its proper host. Usually mange is observed in poor neglected animals. These are certainly not the exclusive conditions under which mange in cattle has frequently come under our notice. Indeed, our experience rather suggests that it is, at any rate, more frequently observed in high-class, highly fed, and, generally speaking, well-cared-for animals. Observation at the entrances to our showyards indicates that mange is not very uncommon in show cattle, and that the stringent rules as to non-admission of cattle affected with contagious skin disease are thoroughly warranted. Prevalence of mange in show cattle may be accounted for in two ways : animals from many sources are congregated, and are more or less closely associated in the showyard ; and, while there, they are, one after the other, well handled by innumerable keenly interested visitors, who possibly sometimes transfer the parasite from the affected to the healthy.

The *Sarcoptes*, the smallest of the three, is not regarded as a common cause of disease in cattle. It does, however, exist, and more frequently than is generally supposed. The parasite is microscopic in size. When a mature fertilised female reaches the skin, she pierces it, and bores her way into the

substance, forming a minute channel. As she proceeds, she deposits her eggs, and when the process is completed, dies. The eggs, as embryos, pass singly out of this little channel and become fecundated by the male on the surface of the skin, and the females of this generation repeat the process of boring and hatching a new generation; so that the skin of the animal, the subject of sarcoptic mange, has on its surface mature and immature parasites commencing to bore, or developing for this purpose, while in the substance of the skin are eggs and embryos. It therefore follows that while dressings applied to the skin may kill the parasites on the surface, the coming generation, protected by its position in the little channel, must be provided against by repetition of the dressing. The form of disease caused by this parasite is usually found on the upper surface of the body, and tends to spread at the border of the lesion. The irritation is greater than in the other forms.

The other two varieties, psoroptic and symbiotic, which may be found together on the same animal, usually attack the root of the tail and the neck, and the *Psoroptes* have a greater tendency to spread to other parts of the skin, while the *Symbiotes*, which live together in groups, rarely wander from their common seat, the root of the tail. Neither of these acari burrows.

Symptoms.—These result from irritation caused by the pricking of the parasites, and possibly the insertion of some irritating substance. The degree of irritation varies; in some cases it is slight, in others it is intense, and the animal may be much disturbed, rubbing violently, and sometimes severely injuring the skin, which, in the sarcoptic variety, may become thickened, hard, and wrinkled. Cattle out of doors appear less affected; indeed, it is asserted that turning out to grass is a cure. This is doubtful, for it is often found that on returning to the house the disease again becomes active; and though the possibility cannot be denied, spontaneous cure is not common.

The diagnosis absolutely depends on discovery of the parasite, which is accomplished by aid of the microscope.

Treatment.—Though there is little disposition for the acarus to leave its host, and it cannot live and develop apart from him, it is liable to removal by various means, as by animals rubbing each other, &c., and the disease must be regarded as contagious and treated accordingly. Affected animals should be isolated. If the disease is recent and limited, it may suffice to dress the affected parts only; but if there is any doubt on this point, and usually there must be, it is advisable to apply the dressing all over the animal. The skin is better prepared for receiving the dressing if washed

in tepid water with soft soap and dried. Dressings should be thoroughly applied. Sulphur, tar, creosote, paraffin, are all effectual. Mercurial ointment is sometimes used for dressing limited areas, but there is always a certain amount of danger connected with this preparation. The application should be made two or three times, with intervals of about a week, and then may or may not be washed off. In providing for any parasites which may have left the affected animal, anything with which these have been in contact should be disinfected after each dressing of the animal with a solution of blue vitriol or carbolic acid, and all contaminated litter burnt.

Ticks.[1]—These parasites are of the same Order as those causing mange. The family name is Ixodidæ. They are widely distributed over the world and attack animals of many varieties. Mammals, birds, reptiles, amphibians, all harbour them, and may transport them long distances.

Until within recent years, ticks have been popularly regarded, in Great Britain more particularly, as parasites of the sheep, but we know them to be common on sheep, cattle, and dogs in some parts of the country. They are temporary parasites living apart from their proper ultimate host for considerable portions of their existence. Ticks are of comparatively large size, all being visible to the naked eye, the six-legged larva being about one-sixteenth of an inch long, while the mature female, distended with eggs and with blood sucked from the host, may be three-eighths of an inch long, and a quarter of an inch broad, or the size of a small horse bean, to which it bears some slight resemblance. The male also becomes distended after a meal of blood, though not to the extent of the female. The female, when fully distended with eggs, drops off on to the ground and undergrowth, where she discharges her very numerous eggs, shrivels up, and dies. In about fifteen days, six-legged larvæ are hatched from the eggs, and may live for months, attached to dry grass, &c. As many as 2,000 larvæ have been counted on a single blade of grass. After further development into nymphæ and mature ticks, they are adapted for piercing the skin deeply, and for holding on very tenaciously ; so that, in attempting to remove the tick by force, the head or rostrum often breaks off and remains in the skin.

Redwater.—Investigations in America led to the discovery that ticks were essential to a serious disease of cattle called Texan fever. More recently it has become known that some of the scourges of cattle in South Africa are brought about through their agency. These discoveries have excited

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[1] See also page 274 of this Volume.

considerable attention, and it is now believed that in the production of the disease known in the United Kingdom as "Redwater," ticks play an important part. From time immemorial, in various parts of the kingdom, particularly in Devon, Cornwall, the northern counties, Scotland, and Ireland, both adult and young cattle have been liable to an affection, more or less fatal, whose most striking symptom is the passage of blood-coloured urine, and commonly known as "Redwater." There seems little room for doubt that the appearance of this disease depends on ticks. In this affection, the tick probably plays the rôle of carrier of a disease germ, a low form of life, called a *piroplasm*, which it introduces into the blood of its host. This germ dissolves out from the red blood corpuscle its colouring matter, which appears in the urine. These piroplasms are obtained by sucking the blood of cattle containing them, but one of the most remarkable features is the transmission of the piroplasm to the progeny of the tick.

If a mature female tick is taken from an animal suffering from redwater, and its young are hatched apart from affected animals, and placed on healthy animals, these become affected with redwater. If some of the blood of such animals is injected into a healthy animal, the latter takes the disease. It has been observed that after an animal has had redwater and apparently recovered, the disease may recur if the animal is subjected to any debilitating conditions. Animals bred and reared in situations where redwater is common appear less liable to take the disease in a serious form, while purchased animals often suffer very severely. The disease rarely affects cattle grazing on high ground, or that which has been recently cultivated. Though this affection is not a disease of the skin, it is as substantially due to the attack of skin parasites as the irritation which results from their movements and punctures. In Great Britain the number of ticks attacking an animal is usually small, and the symptoms of local irritation are not very severe.

Treatment.—The knowledge of these facts suggests increased attention to the maintenance of the skin free from parasites. Experiments with sheep dips have shown that any of those effectual in scab will rid animals of this pest; this is applicable to ticks on cattle. For prevention, cattle should be kept off infested pastures and places where there is old, dry grass or undergrowth. The burning of dry grass, &c., and the ploughing of infested fields are indicated, while the sure method of dealing with ticks on cattle is to pick them off and burn them; the application of a little paraffin facilitates this somewhat tedious process.

Ringworm.—This prevalent affection of cattle is caused by a minute vegetable parasite or fungus (*Trichophyton mentagrophytes*), which gains access to the hair roots, where it grows more or less rapidly, causing removal of the hairs, the production of scales of epithelium, and sometimes inflammatory liquid. It is usually met with in calves and young cattle, commencing at the lips or about the eyes, and spreading to the rest of the head, neck, and upper parts of the body, rarely affecting the lower parts. The ringworm is usually first observed in the form of a circular, grey, elevated patch, of which several may appear at about the same time ; these may extend and coalesce, so forming very large areas. Ringworm is not usually regarded as a very serious disease ; indeed, it often disappears spontaneously. Occasionally, however, the disease manifests itself very severely, and in addition to the ringworm on the surface, there may be considerable liquid poured out, or a weeping, while the skin may be much swollen. In such cases the general health is rather seriously affected, and we have known fatal results. Low condition of the animal and a dirty condition of the skin appear to favour the activity of the parasite.

The symptoms are obvious in the ringworm ; in acute cases there is a good deal of irritation, which causes the animal to rub itself, bringing off much hair and sometimes causing the skin to bleed. Under any circumstances, ringworm is an annoying and undesirable disease, temporarily disturbing animals, and interfering with their well-being.

The affection spreads from calf to calf, and often when such are congregated in house or yard, nearly every animal becomes affected. The ringworm of cattle can be communicated to the horse, the dog, and probably other animals ; but the malady gains its greatest importance from the fact that its fungus grows readily on the human subject, and in children induces a severe and somewhat intractable form of ringworm (*Herpes circinata*), in which there is acute inflammation of the scalp. This is then readily spread from child to child. There can be little doubt but that the systematic medical inspection of schools will draw attention to this not uncommon origin of child disease, which, fortunately, is suppressible by the exercise of care in the treatment of cattle.

Treatment.—In many cases, plentiful supply of good food —always an essential of any system of treatment—is alone sufficient. Such happy results are, however, not always attainable, and not infrequently, ringworm is troublesome to get rid of. There are many remedies at our disposal, as mercurial ointment, iodine, creoline, paraffin, turpentine. It has come within our experience to meet with fatal results from

the application of poisonous dressings for ringworm, and in obstinate cases, or where the ringworms are extensive, treatment under the direction of the veterinary surgeon is likely to be more effective and safer.

The spores of the ringworm fungus live a long time, certainly for six months, probably longer, apart from animals. They have been found on posts, &c., where affected calves have rubbed, and this suggests the application of disinfectants to places likely to have been contaminated, and the burning or ploughing in of litter.

Internal Parasites of Cattle.

In common with other domesticated animals, cattle harbour in their internal organs a great variety of animal and vegetable parasites. It will only be possible here to refer to some of the more salient points concerning those usually recognised as more important. The majority of these are commonly known as "worms," whose length largely exceeds their breadth.

Proceeding to consider the parasites of the digestive tract, though occasionally the "ray fungus" and some bots are found in the back of the throat, and some fluke-like bodies (amphistomes) in the rumen or paunch, it is not until we come to the fourth or true digestive stomach, or *abomasum*, that we reach the location of parasites whose effects are generally recognised as common or serious.

Parasitic Gastritis.—The true digestive stomach of cattle may harbour other worms, but it will be sufficient for our purpose to state that those most frequently found associated with serious disease in cattle are minute strongyles, which, though not actually microscopic, are too small for recognition in the stomach with the naked eye. Roughly speaking, these strongyles are from one-eighth to one-third of an inch in length. In some instances, only individuals of one species are met with; in other instances individuals of two species are in association. In severe cases of the disease attributed to them, these worms exist in myriads. If the inner lining membrane of the stomach of an affected animal, recently dead, be gently scraped with a knife, and the scrapings transferred to a watch glass or small clear glass phial containing pure tepid water, the minute hair-like worms will be readily discerned, sometimes actively moving; and if placed under a low power of the miscroscope, it will be seen that they are highly organised, and the distinguishing features of sex and species will be apparent. The males and females are all mature, the latter usually containing a large number of eggs; on the slide may be found eggs, but no intermediate stage of the worm, *i.e.*, no form between that of the egg and the mature worm, thus indicating that in all

probability parasites do not increase in the stomach. A little while after death, the worm is more readily found in the contents of the stomach, which are usually quite liquid.

Though, occasionally, post-mortem examination reveals some redness of inflammation, frequently only a watery condition of the mucous membrane of the stomach is noticeable, and a carcass often presents nothing remarkable to the ordinary observer, and beyond the emaciation and catarrh of the stomach, no more to the expert. There is, therefore, little wonder that, prior to the discovery of the cause of the affection, the losses were attributed to other and various agencies. We are not aware that until 1892, when we contributed an article to the "Veterinary Record," announcing the discovery of the parasites, the real nature had been recognised.

Unfortunately, nothing is so far known as to the life-history and development of these worms. Only mature worms and eggs have been encountered in the stomach or the bowel contents and fæces of affected animals. It is therefore probable that eggs develop into embryos outside the bodies of cattle, and that after further development these are taken in with food or water. Some actual observations on worms of the same class suggest that moisture and a period of residence within a soft-bodied animal, such as a worm, or snail, is a necessary part of the life-cycle of the worm.

The disease is usually noticed in the autumn and early winter, and though young cattle are most frequently its subjects, it is occasionally met with in adults.

Symptoms.—The manifestation of symptoms will depend very largely on the number of the worms in action in the stomach. The effect of a few will probably be inappreciable. In somewhat rare instances the manifestations are acute, severe, and rather rapidly fatal. In the majority, the symptoms are less severe, and the course of the disease more protracted. Indeed, often the malady is sub-acute and of long duration.

Diarrhœa, wasting, and poverty of blood (anæmia) are the special features met with in all forms. Its subjects are first observed to lose their bloom and to do badly; diarrhœa is usually noticed from the early stage, and is continued throughout, getting more and more continuous and profuse. The membranes become paler, and emaciation more marked; occasionally, in the later stages, dropsical swellings may be noticed under the dewlap and between the lower jaws. Throughout, the appetite generally remains good. There is little other constitutional disturbance, and no fever. These conditions may last for several months, and such animals are popularly known as "piners, wasters, scanters, skinters, scrofulous, and consumptives," though probably it should

not be taken for granted that these strongyles are responsible for all cases included under these designations. It is sometimes possible to find the parasite in the fæces, which is, of course, proof positive, though the results do not always justify the trouble of searching.

Prevention.—It is most important to bear in mind the fact that infested animals, whether showing signs of the disease or not, are passing the eggs of the worms. If at grass, these are scattered over the pasture, rendering it dangerous to other susceptible animals. This method of distribution of parasite ova is one of the main factors in bringing about that condition of pasture known as soiled, foul, over-stocked, and cattle-sick. Animals known to be, or suspected of being, infested with worms should be kept indoors, and their droppings ploughed deep into the land, or burnt. Young cattle, especially, should not be grazed on pastures known to be infested. Horses, adult sheep, and adult cattle run fewer risks on such pastures. There is no reason for thinking that the eggs or embryos of the worms live apart from animals for indefinitely long periods, so that if it were practicable to keep susceptible animals from infested pastures for twelve or eighteen months, it is probable that the danger would be removed. The ploughing of infested grass land—we grant not often practicable—is likely to render such free. Though little is known of the life-history of the worm, many circumstances indicate the desirability of preventing access to dirty pools, and avoiding depasturing on land which has been flooded.

Top-dressings of lime and salt are advocated, and such may be, in some degree, beneficial from this point of view, while recent experiments will appear to indicate on other grounds the desirability of the more frequent use of lime. Though such agents may not, even in large quantities, destroy all adult parasites, it is possible that they provide conditions detrimental to them. Cattle may harbour a few of these strongyles, while they show no symptoms, and it is important to remember that each female worm is capable of laying an immense number of eggs, and so possibly of maintaining the existence of the disease on a place, or of taking it to fresh situations. Adult animals withstand attack better than the young. It is therefore a better practice to allow the younger to have the first bite than to follow adults in grazing.

It must be confessed that this form of parasitic invasion is not readily amenable to curative treatment. While it cannot be denied that the administration of remedies in some cases materially assists in recovery, a certain, indeed, a large proportion of cases, in which the symptoms are marked, appear not to be favourably affected by any drugs administered. In the

present state of our knowledge, if there are good grounds for suspecting cattle of being infested, while they are fit for the butcher, it is probably economical to sell, rather than treat them. Unfortunately, however, infested cattle are usually emaciated before the nature of the malady is realised, and sale to the butcher is then out of the question. If remedial measures are to be adopted, the animals to be treated must be kept warm ; and as the disease is usually noticed in the late autumn and winter, it is best, if possible, to house them. This, in addition to protection from cold, which the anæmic state demands, will allow of the destruction of the parasite eggs passing from the patient. A liberal diet is equally necessary.

Drugs likely to kill or expel these worms must be potent, and care must be taken to make certain that what is given does not injure the "host" more than the parasite. The choice and administration are best directed by the veterinary surgeon. It has been the practice to prescribe chloroform, turpentine, tar, carbolic acid, thymol, lysol, &c., and we are disposed to the view that in the incipient stage of the disease, in cases where the struggle between parasite and host is just in the balance, such drugs, especially the first named, may turn the balance in favour of the host. Periodic administration of such medicines, bitter tonics, and plenty of common salt, probably ward off attack, and we think this plan may be adopted with advantage in situations given to the disease.

As a cure and preventive, tobacco has been highly spoken of. Mr. Ernest Mathews advocates the administration of half an ounce of shag tobacco in the form of a ball every other day for a week, then allowing an interval of a week, and, in the case of animals showing symptoms, proceeding in this manner until marked improvement is effected. As a preventive, the same dose is given on alternate days for a week, at equal intervals, four or five times while the animals are at grass. The animals are supplied with pure water to which a little lime has been added. We have received other testimony appearing to be favourable to this method of treatment which seems worthy of an extended trial.

Tapeworms.—The intestines may harbour tapeworms, or *Tæniæ*, of three species. Neither, as a rule, gives rise to appreciable symptoms. These curious creatures are really a colony of segments in Indian file, each fully adapted for purposes of reproduction, and the mature ones farthest from the head contain immense numbers of eggs.

The most common is the broad tapeworm (*Tænia expansa*), remarkable for its great length (sometimes reaching sixty feet), and the breadth of its segments. It occasionally gives rise to some abdominal pain. This, however, is rare. The same

tapeworm infests the intestines of the sheep, and is credited with causing diarrhœa, &c. Its presence in the intestine may be indicated by the appearance of segments in the fæces.

The whip worm (*Trichocephalus affinis*), a parasite usually found holding on to the lining of the bowel, is about one to one and a half inches long ; it has a very small head, and very long slender front portion, and somewhat abruptly thickens towards the tail. Ordinarily only a few specimens are found in an animal, and little importance is attached to their presence. Occasionally many are found coiled up together in the form of a small ball in the intestinal tube. This parasite also infests the sheep.

Liver Fluke (*Distoma hepaticum*) is sometimes found in the liver of the ox, but rarely giving rise to symptoms. This organ very commonly contains dense walled bladders, cysts, or hydatids (the *Echinococcus veterinorum*). This bladder or cyst contains a watery liquid and very large numbers of the heads of minute tapeworms which inhabit the intestine of the dog. Of these cysts we may meet with just a single specimen, while in some cases they are so numerous as to appear to occupy nearly the whole organ. They are whitish, most frequently about the size of a walnut ; occasionally larger specimens are met with. They are also found in the lungs and in these and other situations in cattle, sheep, and man. There are no distinctive symptoms shown during life, though they are often very numerous. They may cause loss of flesh, unthriftiness, indigestion, &c. If the cysts are swallowed by a dog, minute tapeworms, one-third to one-half of an inch long (the *Tænia echinococcus*), develop in his intestine. The preventive treatment consists of destruction of all the cysts, which may also be found in many other situations, and the treatment of dogs in the manner to be described under "gid" in sheep.

Hoose, Husk, or Parasitic Bronchitis.—Cattle may harbour in the windpipe and its smaller branches (bronchial tubes) fine worms (strongyles), that special to the ox being named *Strongylus micrurus*. These are usually met with from one to two inches in length, and may be found singly or in considerable numbers, matted together in bundles in the bronchial tube. The mature female is usually full of living embryos. Here they induce irritation and the production of mucus, and the disease known as parasitic bronchitis, hoose, husk, &c. Young cattle at grass are more commonly its subjects.

Symptoms.—The irritation of the bronchi and the collection of mucus cause a cough of a husky character. This cough which is usually noticed from March to October is frequent and easily excited if the young animals are moved about rapidly or hustled. Sometimes paroxysms or fits of coughing

are severe, and difficult breathing is much marked. The paroxysms probably depend on movement of the bunches of worms in the bronchi, which are dislodged by the cough, and then inhaled into a tube, blocking it. Sometimes under these circumstances the animal may appear as though choked. Mucus is often discharged through the nostrils and may contain the parasite or its embryos, or both. In severe cases there may be great depression and a high temperature indicating inflammation of the lungs; but in milder cases, which are commonest, the young animal's general health and appetite are not much affected. In a certain proportion of cases diarrhœa is present, emaciation is very marked, and the course of the disease is rapid and fatal. This we take to be evidence of the co-existence of minute strongyles in the stomach and of the *Strongylus micrurus* in the bronchi. When there are only a few worms in the air passages recovery usually takes place in the winter.

Concerning the development of the *Strongylus micrurus* little is definitely known. The females are seen to contain immense numbers of living embryos and worms, and embryos are found free in the bronchial tubes. There is every reason for supposing that the embryos do not develop into worms within the "host," for if large numbers of embryos, taken from the lungs, are given to cattle or injected into the windpipe, no worms are to be found in the bronchial tubes afterwards. It is assumed that the embryos and those of other strongyles pass out of the animal's body into some soft-bodied animals as worms, or snails, and there undergo some essential change rendering them fit to live in the bronchi of cattle. Experiment shows that the embryos live in moisture for months, and after having been dried, resuscitate on being placed in water; also that embryos coughed up and discharged in dry weather may remain dormant in the dry condition for weeks and revive after rain.

Prevention.—In the absence of knowledge of the life-history of these worms, measures of prevention cannot be adopted with the precision desirable. The results of common observation, however, indicate certain lines which are likely to be followed by a degree of success. Calves and yearlings should not be turned on to pastures suspected of being infested; indeed, when practicable they should be kept on young grass which has not been depastured with cattle. Land holding water, flooded land, dirty pools, &c., should be avoided. It is deemed advisable to keep young cattle housed at night, turning them out only after the dew has gone, and to give some dry food before turning out. Shelter from cold and a liberal diet are important, and the admixture of common salt with manger

food is indicated. In fact, the general treatment against strongyles suggested for preventing attack of the stomach worms applies equally here.

Attempts to cure "husk" with the means at our disposal will probably only lend support to the conviction that "prevention is better than cure." The administration of worm medicines by the mouth is still much relied on, and the inhalation of irritant gas, as chlorine and sulphurous acid gas, is sometimes practised, but neither of these can be relied on to effect a cure in cases in which there are large numbers of worms. The injection into the windpipe of chloroform, turpentine, carbolic acid, &c., is probably more effectual. All should be carried out under direction of the expert.

External Parasites of Sheep.

"The Maggot," "Fly," or "Worm."—No parasitic attack is perhaps so widely known in Great Britain as that referred to under the above names. This, in late spring, summer, and early autumn, is the daily bugbear of the shepherd. It is particularly encountered in warm, damp, muggy weather, and in low-lying situations. Its occurrence is largely determined by moisture of the fleece, especially that due to the sheep's excrement; consequently it is most common in animals affected with diarrhœa, whose hinder parts are soiled, while wounds afford favourable conditions. It is not usually regarded as a serious matter, but it always interferes with the animal's well-doing, and if neglected, may seriously affect its health and even end fatally.

The condition is due to the maggots of true flies of one or more species. The flies credited with this power are *Lucilia sericata*, *Lucilia Caesar* (both of a bright golden green or greenish blue tint and metallic lustre), and *Sarcophaga magnifica*, a large grey fly. The latter probably more commonly deposits its larvæ or maggots in wounds. The flies deposit their eggs or larvæ only on living animals, and not on dead flesh. Neither is the common meat blow fly.

These parasites, with methods of treatment, were fully described by the Society's Zoologist (Mr. Cecil Warburton) and by the late Sir George Brown in the Journal for 1902 (Vol. 63, 1902, pp. 297, 298; 416-420); and leaflets on the subject are obtainable from the Society for gratuitous distribution. It is therefore unnecessary to give further details in this article.

Lice or Pediculi.—The true louse of the sheep is the *Trichodectes sphærocephalus* (Fig. 4), a small insect about one-sixteenth of an inch long, with a whitish body and broad red head, usually found sticking closely to the skin. It produces some irritation,

and by the uninitiated has been sometimes mistaken for and confounded with the scab parasite or the larva of the ked. Though in some districts it gives considerable trouble, it is not a widely distributed parasite. It is easily distinguished by its larger size, and having only six legs, whereas the smaller scab mite has eight. It bites skin and wool, and injures fleece and causes irritation. Treatment is included in that for "scab."

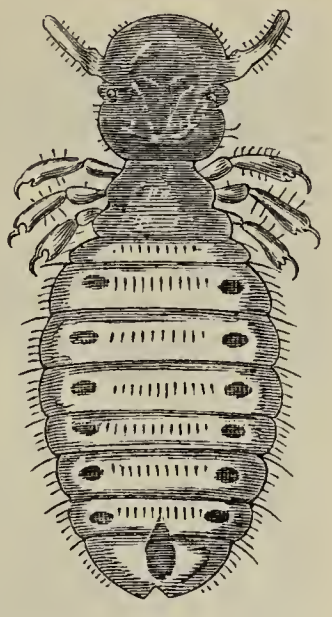


FIG. 4.—*Trichodectes sphœrocephalus.*

Ked.—The name "sheep louse" is, however, most commonly associated with that ubiquitous insect, the "ked," or *Melophagus ovinus* (Fig. 5), so often erroneously called the "sheep tick." This familiar brown wingless insect, varying from the size of a small pea to that of a small bean, lives and breeds in the skin of the sheep. It does not lay eggs, but its young are brought forth as pupæ, which become attached to the wool fibres, appearing like small brown seeds. This parasite lives on the skin products, and also extracts the blood of the sheep after piercing the skin. It is so familiar that it is not usually considered injurious. There

FIG. 5.—*Melophagus ovinus* (magnified).

can, however, be no question but that its presence is detrimental to the sheep, which it irritates and robs of blood. It is destroyed by most applications advised for scab; but, as the larvæ are not so readily killed as the mature "ked," two applications, within two or three weeks, are usually necessary. It is probable that its reappearance after a single dipping and its almost constant presence in sheep is due to this survival of the pupæ.

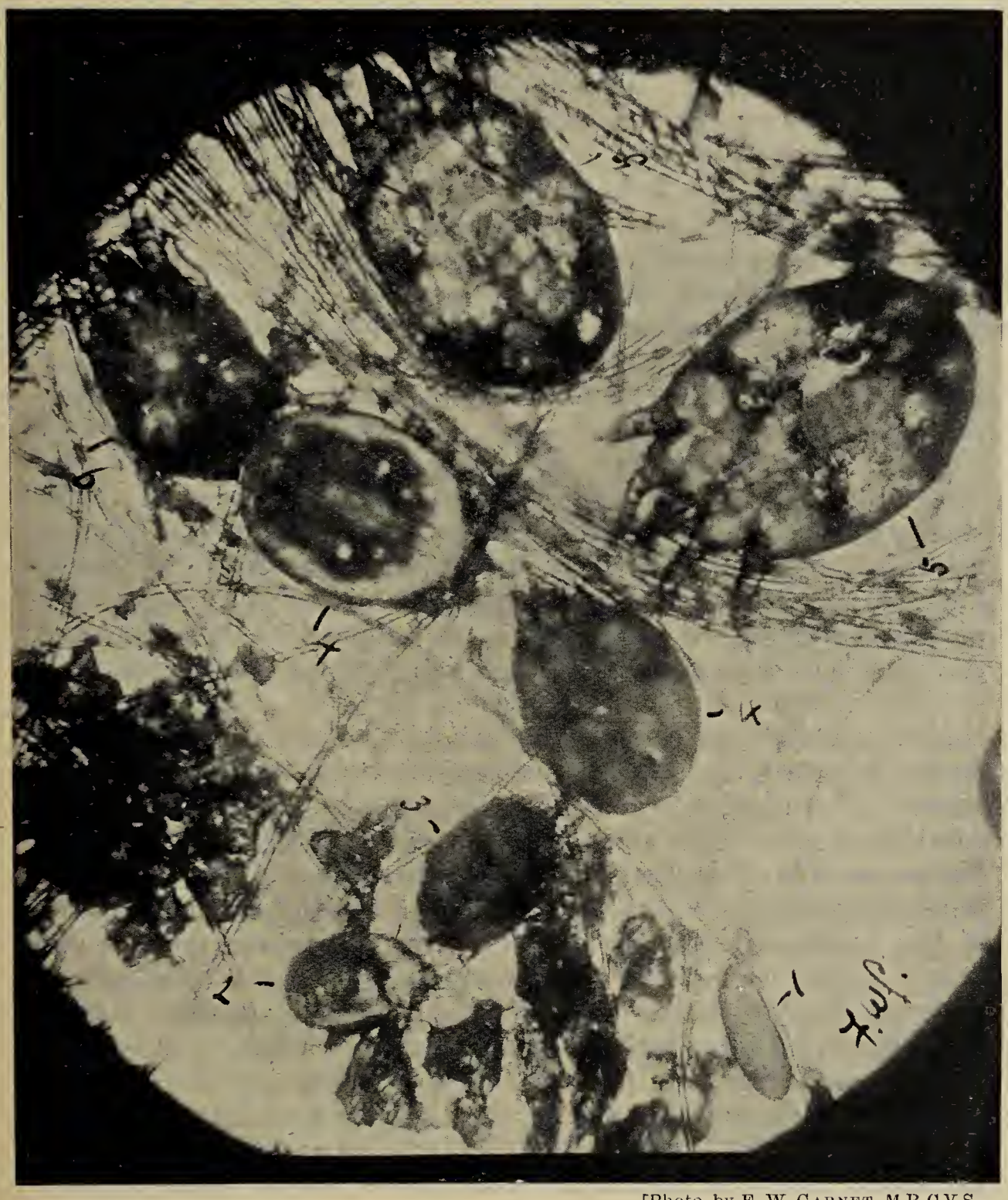
Sheep Scab.—"Scab," "shab," "rubbers," "sceal," "tetter," and other terms have been, from the earliest times, applied to a disease of the sheep's skin. Anglo-Saxon records show that this disease was prevalent in Great Britain in the distant past, while the fact that in the year 1893 it was known to exist in at least eighty-six out of the ninety-six counties, speaks clearly as to more recent times.

FIG. 6.—Female Acarus causing Sheep Scab.

Though always regarded as a troublesome and loathsome affection, it was not often allowed to be fatal, and had come to be looked on as something "which always did exist, and always would exist"; indeed, it had for centuries been known to be preventable and curable, but had been borne so long that its very familiarity had caused its effects to be held in contempt. As our sheep have become more valuable and called for greater care, and perfection and rapid maturity have become matters of greater importance, stock owners have realised the injurious and annoying effects of the disease and have co-operated in the call for compulsory measures towards its prevention. At the present time the result of measures recently adopted indicates the possibility of eradicating the malady entirely, a promise, the accomplishment of which appears mainly dependent on the thoroughness with which those measures are carried out by sheep owners.

Cause.—The mature acarus or mite (*Dermatodectes ovis* or *Psoroptes communis*, var. *ovis*), which causes sheep scab, though minute ($\frac{1}{45}$ of an inch long), is just visible to the naked eye (see Fig. 6). If wool is plucked from the outer edge of the scab and warmed, the parasite may be seen on a wool

fibre, sometimes performing active movement with its legs, of which the mature parasite has four pairs. It is more distinctly seen with a magnifying lens ; or if some of the moist material from the border of a scab, mixed with a little glycerine and a



[Photo. by F. W. Garnet, M.R.C.V.S.

Fig. 7.—Colony of Acari causing Sheep Scab.

1. Ova. 2. Hexapod larva. 3. Nymph. 4. Pubescent females. 5. Oviparous females. 6. Male.

solution of soda, is placed under the microscope, mature acari, six-legged larvæ, and eggs may usually be observed. It does not burrow, but lives and breeds on the surface, stabbing and

pricking the skin to which it clings for a while. Considerable irritation is induced causing the sheep to rub and bite and so injure the infested part as to make it bleed, and produce the scab, which gives the disease its name. The lesion, or scab, is therefore the result of the irritation of the acarus and the rubbing and biting of the sheep, and its only special feature is the scab mite. The acari increase rapidly and invade other healthy parts of the skin, thus extending the original area, while in the process of rubbing they may be carried to distant parts and set up fresh centres of the disease in the animal. Fig. 7 represents a colony of acari in various stages of development as reproduced by photography from a case of actual scab.

Symptoms.—Usually the upper parts of the body, *i. e.*, neck, shoulders, back, and sides are attacked. The sheep manifests its irritation by biting itself, and rubbing against anything which may afford the opportunity, as posts, gates, hurdles, or other sheep, and large portions of the fleece may be removed, leaving the scab in view. The wool thus removed usually contains the mature acari, larvæ, or eggs, and is one of the most important means by which the disease is spread. The sheep is often disturbed in feeding, runs forward and makes nibbling movements with the lips. The diagnosis of scab, however, depends on the discovery of the scab mite. "No parasite, no scab," is the axiom. It is usually fairly easy for the expert to detect the parasite in the manner mentioned.

The search for it is suggested by the observance of common symptoms: wool about the hedgerows, pastures, and posts, the broken matted fleece, and evidence of irritation shown by the sheep, alone excite suspicion; but all these conditions may be brought about by other parasites than those of sheep scab. The scab mite lives for some time—probably at most a few weeks—apart from the sheep, but there is no evidence of its propagating elsewhere except on the skin of the sheep. It will therefore be seen that sheep may become affected with scab by contact with infected sheep, objects against which they have rubbed, or their wool which has been removed by rubbing. Infestation must of course be by transfer of eggs, parasites, male and female, or the impregnated female which lays her eggs on the skin of the invaded sheep. These are probably hatched out in about seven days, while about fourteen days are required before the young acari are mature and capable of laying eggs. The fleece to a large extent protects the acarus, which is a parasite of the skin on which it feeds. It exhibits no natural tendency to leave the skin of its host; therefore when scabby and healthy sheep congregate closely, it is probable that very few acari pass from the affected to the healthy sheep, so that in those cases in which scab is

contracted by association with affected sheep, probably the symptoms of the disease will not be manifest for two or three weeks or more after contact.

It is possible, where scab has been acquired by rubbing on objects which have served the purpose for a scabby sheep, that considerable numbers of the parasites may be transferred to the healthy sheep, which, in such case, might show signs of irritation earlier. Experimentally, they have occurred in fourteen days after infestation. It must be borne in mind that keds, ticks, and lice are extremely common in sheep, and frequently co-exist with the scab parasite. It is probable that these other parasites play an important part in the spread of scab, by causing scab-free sheep to rub against objects on which scabby sheep have been rubbing. "One scabby sheep infects a flock" is an old saying rendered none the less true by the above fact. While scab may perhaps be usually spread in a flock by rubbing on inanimate objects, it does not invalidate the postulate, that scab is usually introduced into a flock by the admission of affected sheep.

Sheep scab, as shown by the returns of the Board of Agriculture, occurs more in winter than summer, a circumstance probably accounted for by the fact that dipping is usually practised in the early summer. It is more common in mountainous districts where sheep are scattered, do not congregate frequently, or receive comparatively little individual attention.

Prevention.—The Sheep Scab Order of 1905 imposes on the owner of sheep affected with scab, or suspected of being so affected, the duty of giving notice of the fact to the nearest police constable. Measures to be adopted in flocks in which scab exists must provide for the destruction of mature parasites and their eggs. One thorough dipping in any effective dip will probably kill all living parasites, but the eggs may remain a source of danger, so that a second dipping should be given in from seven to fourteen days after the first, which will probably effect a cure by destroying any acari developed from the eggs. In rare instances, however, usually dependent on inefficient material or imperfect operation, some doubt may remain, when a third dipping should be resorted to. The process of "salving," *i.e.*, the application to the skin of some greasy parasiticide, such as mercurial ointment, is still preferred by some flockmasters as being a more certain means of cure than dipping. That salving with mercurial ointment may prove an effectual form of treatment is beyond doubt. There is some danger to the life of the sheep connected with its use, but the experienced hand who is able to dress the whole of the skin with a very small quantity does not run many risks. In old-standing cases it

may sometimes be advisable to adopt this plan, but the general outcome of the inquiry of the last Departmental Committee indicates that certain dips are effectual and easy of application, while it is important that every sheep shall be subjected to some effectual process. The essence of the prevention of scab of course lies in the cure, *i.e.*, destruction of the scab mite.

That dipping is effectual for the destruction of the scab mites and the skin parasites, which usually co-exist on sheep, and cause much irritation, restlessness, loss of flesh, damage to the fleece, and aid the extension of scab, has for a long time been recognised, and the practice has been adopted by flock masters who realised their responsibility and the advantages to be gained. The momentous decrease of the disease since the compulsory dipping Order came into force, gives good grounds for hoping that this pest may be exterminated within a reasonable time. This will, however, depend on the manner in which the provisions of the Order are carried out. The first essential is that the dip be effective; the second, that the dipping be properly performed.

Two other species of scabies, mange, or scab parasites may be mentioned, although they are not commonly recognised as inducing diseases in sheep in Great Britain.

Sarcoptic Mange.—One species, Sarcoptes, usually confines its attacks to the parts covered with hair, *i.e.*, head and legs. It is the burrowing mite and its description in reference to cattle will suffice. It is rarely met with in Great Britain.

Symbiotic Mange.—Another species, the Symbiotes or Chorioptes, have oval bodies and thick legs, and move about in groups, but are rarely found elsewhere than on the legs. Here they induce irritation, in some cases swelling and the formation of sores, giving rise to a condition of the legs, especially above the claws, included under the head of "dew rot"; while some writers, without much show of proof, regard this parasite as the cause of one form of foot rot.

Both these forms of scabies yield to cleanliness and the application of sheep dips and other medicaments fatal to the "scab" parasite.

Ticks.[1]—The parasites of the family were referred to at length under "Ticks" in cattle, and will only require brief notice here. The error of calling the common "Ked," or *Melophagus ovinus*, the sheep tick has led to the view that ticks are very commonly found on sheep in almost every part of the kingdom. This is probably incorrect. The idea of such a wide and general distribution is not based on any reliable reports yet available. They are, however, common in some districts, notably hill pastures in the Border counties, the

[1] See also page 274 of this Volume.

Western Highlands, and in the western-most counties of England. In these districts they are usually found on sheep from March till September. Beyond the immediate effects of skin irritation, the tick is sometimes credited with introducing the germs of a disease known as "louping ill" and also other diseases.

Dipping, as for scab, is effectual both as a cure and preventive, and the other measures indicated for destruction of the tick of cattle should be adopted.

Scarlet Mite or Harvest Bug.—This minute parasite, the larva of the *Trombidium holosericum*, of the Order *Acarina*, is sometimes found in the late summer and early autumn attacking the inside of the thighs and forearms of sheep. It is just visible to the naked eye, about one-twentieth of an inch long, and of a reddish colour. In some seasons this parasite induces considerable irritation. The infested sheep is noticed to be uneasy, tries to reach its forearm and neck with its hind feet, and nibbles the skin on the inside of the legs. The irritation lasts only two or three weeks—the period which the residence on the animal "host" occupies, for the adult parasite is believed to live on vegetable matter. It cannot be regarded as a very common or very important parasite. It is, however, capable of inducing symptoms which at least might suggest scab, and it is well, therefore, to take cognisance of it. The application of sheep dip or a very small quantity of mercurial ointment stops the irritation.

Internal Parasites of Sheep.

Sheep Warble or Bot Fly.—This small, yellowish grey, slightly hairy fly (*Œstrus ovis*), two-fifths of an inch long, with transparent wings, and of a silky hue, lives in summer, and is remarkable for its rapid flight. It deposits its eggs or larvæ in or about the nostrils of the sheep. At this time sheep are noticed to bury their heads, to rub their nostrils, especially between their forefeet, and sometimes to sneeze and snort. The larvæ gain the air sinuses or cavities of the head, and reside there about nine or ten months. Ordinarily there are but a small number of bots in these situations, and no symptoms are observed during the winter, but occasionally the larvæ are very numerous, and by their gradual growth the whole mass may press on the part and interfere with breathing.

Symptoms.—It is in the early summer, when the larvæ are leaving their winter quarters for the outer world, that symptoms are sometimes very marked. When the larvæ are creeping down from the sinuses in considerable number, there is much sneezing, a discharge from the nostrils, and coughing; the eyes stare and are blood-shot; the sheep may stagger as

though the brain were affected. We have witnessed on rare occasions considerable losses through inflammation of the lungs, and have found larvæ in the windpipe, and considerable quantities of purulent matter there and in the bronchial tubes. Fortunately the *Œstrus* of the sheep is not a very common species.

Prevention.—The preventive treatment, which must be carried out during the summer, consists of application to the nostril and face of sheep in districts where the fly is known to exist, of some substance distasteful to the fly, in order to prevent it from depositing its eggs or larvæ, or of killing them. For this purpose the material spoken of as deterrent to the ox warble fly of cattle is applicable. Probably smearing the nostrils, &c., with tar is most effective and enduring. All practical means should be adopted for killing the larvæ as they leave the nostril in May or June.

Parasitic Gastritis.—The abomasum, or true stomach of the sheep, like that of the ox, may be infested with parasites of various species. The *Strongylus contortus*, a slender round worm, about one to one and a half inches in length, has for many years been recognised as the cause of inflammation of the lining membrane of the abomasum. It is frequently found in the company of other nematode worms, especially minute strongyles, and formerly it was taken for granted that the smaller worms were the young of the larger. Later microscopic search has demonstrated that the smaller worms are of a quite distinct species, to which the name *Strongylus cervicornis* has been given. The worms are found separately or together, inducing the disease under review. This smaller strongyle is usually from $\frac{7}{25}$ to $\frac{9}{25}$ in. in length, the females being longer and more numerous than the males. Though liable to escape observation in the stomach or its contents, it may be readily discerned by means described when referring to the small strongyles of the stomach of the ox. Though round worms of other species are known to inhabit the stomach of the sheep, they are rarely found in large numbers in this country, and are not credited with the production of appreciable disease. Nothing is known as to the life-history and development of these strongyles except that the adult female is seen to contain many eggs, and that on examination of scrapings of an affected stomach only worms and eggs are found.

These parasites are responsible for very serious and extensive losses, especially of lambs, though occasionally adults may be affected. The disease dependent on their attack is common and widespread. Though it claims a large number of victims every year, in some seasons and in some districts it appears as a veritable scourge. A few years since, the disease was so

general and the losses so great among the flocks of Lincolnshire that it acquired the name of "Lincolnshire lamb disease." It has also been spoken of as "true lamb disease." The malady is most commonly met with in the autumn.

Symptoms.—The principal symptoms are diarrhœa, wasting, and anæmia, depression, loss of appetite for food, a disposition to eat sandy or gritty material, thirst, and a high temperature. In a considerable proportion of cases cough is noticeable. Severe cases may prove fatal in two or three days after symptoms are first appreciable, while some of the affected may live for weeks.

Post-mortem examination usually reveals in the stomach a dirty-looking liquid containing sand or gritty particles. The internal lining of this organ may be pale and watery-looking, or red from inflammation. The first part of the small intestine and the cæcum (large bowel) show patches of redness, while in the latter may be found small strongyles of the same species as those of the stomach, and others, as the whipworm (*Trichocephalus affinis*), which are occasionally so numerous as to induce irritation and diarrhœa. On examination of the lungs, the parasite which gives rise to "husk" is usually found, as well as some inflammation of these organs.

Co-existing in the same animal with the above-named, or alone, the broad tapeworm (*Tænia expansa*) is sometimes to be found in large numbers. Its presence is associated with diarrhœa and wasting, and may be revealed by the appearance of the whitish segments resembling short pieces of narrow tape in the droppings. It is remarkable that the manner of life and the conditions essential to the development of these parasites outside the stomach and intestines are so far unknown to science. The picture revealed at post mortem, however, tells plainly enough that some conditions, to which affected flocks have been subjected, must have been favourable to infestation of sheep, and that presumably some foregoing circumstances must have favoured the life and increase of parasites of several distinct species. These conditions appear to be the same as those referred to as favouring infestation of cattle with their stomach strongyles.

Prevention.—Attempts at prevention must be adopted along the same lines as those suggested in case of the cattle stomach worm. If practicable, lambs, where the disease is known to have existed for a year or so, should not graze after sheep, as it is possible that, though not appreciably affected, adult sheep, or indeed lambs, may pass on to the pasture a large number of eggs, which the more readily affected lambs might acquire. The smaller the area of the grazing ground the greater chance there will be for lambs or sheep to take in a

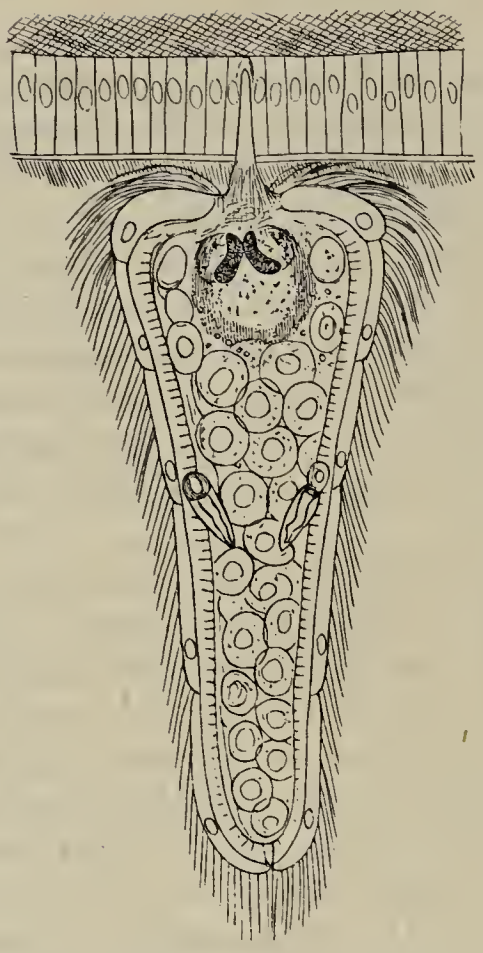


FIG. 8.—Embryo of Liver Fluke boring into a snail.

Only a very small part of the snail has been drawn. (Magnified 370 times.) (Original.—A.P.T.)

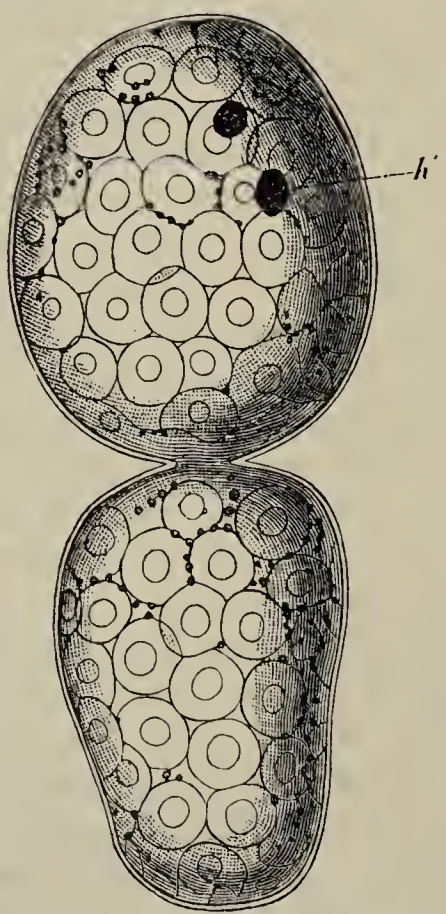


FIG. 9.—A young Sporocyst dividing into two.

h', eye-spots disappearing. (Magnified 500 times.) (Original.—A.P.T.)

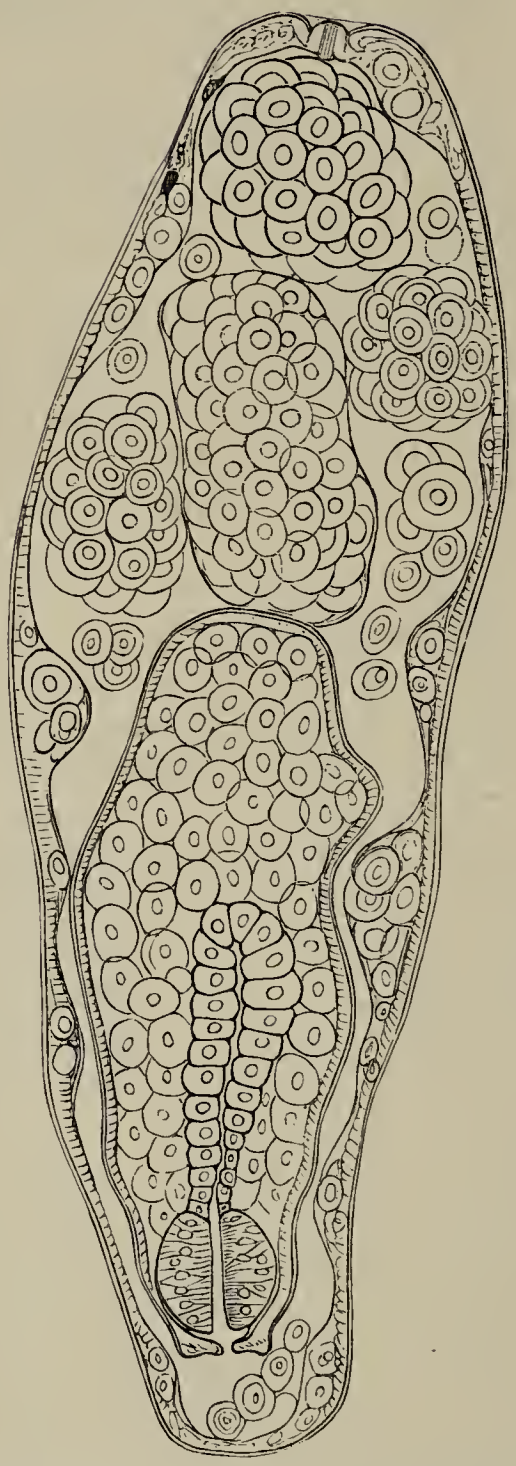


FIG. 10.—A full-grown Sporocyst (the first generation) of the Liver Fluke.

It contains several germs in different stages of growth. The largest, at the lower end, has assumed the characters of a redia. (Magnified 230 times.) (Original.—A.P.T.)

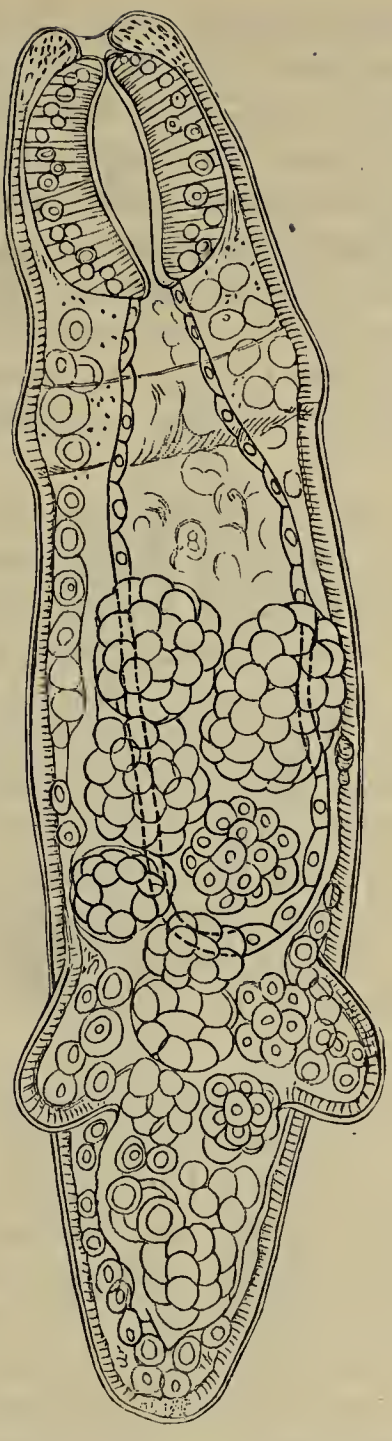


FIG. 11.—A young Redia (second generation) of the Liver Fluke with the contents forming into germs of the third generation. (Magnified 230 times.) (Original.—A.P.T.)

Fig. 12 contains a large number of germs of the third generation. Two of these are so far advanced that they show the characters of the tailed larva or cercaria. It contains also on the left hand a young redia. c_1 and c_2 the two cercariæ; *in*, intestine of cercaria; *w*, *w'*, germs in a very early stage; *r*, *r*, the processes which serve as feet; *in'*, the intestine of redia; *v*, the birth-opening by which the cercariæ leave. (Magnified 120 times.) (Original.—A.P.T.)

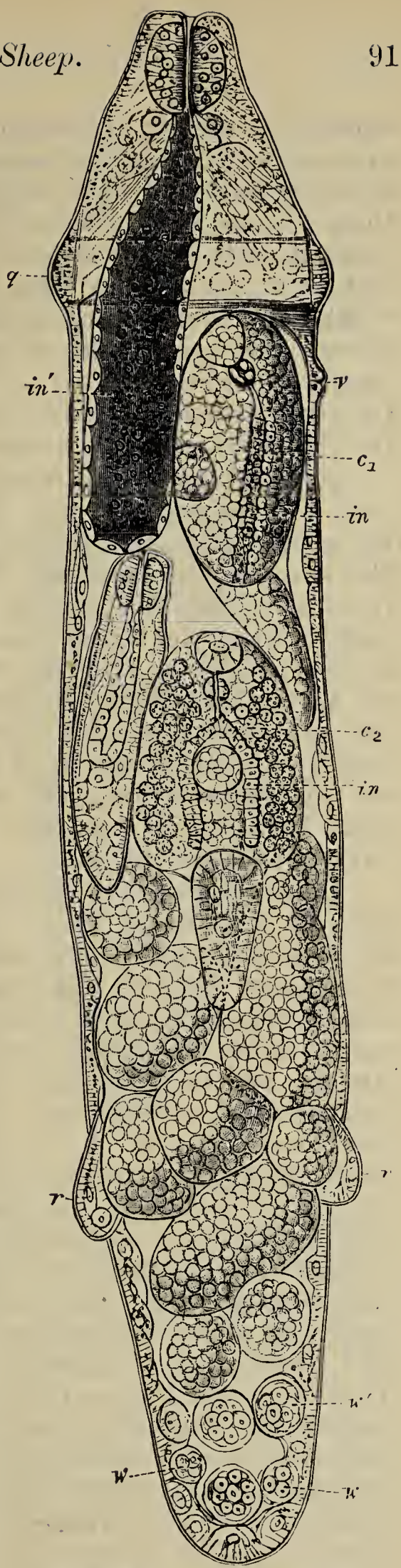


FIG. 12.—A full-grown Redia (second generation of the Liver Fluke).

sufficient number of parasites. On this depends the risks of over-stocking, and the comparative freedom from the disease of sheep having a wide range of pasture. As far as is known, these worms reach maturity, or at any rate the stage of egg bearing, only in the stomach of ruminants, preferably sheep; and as it is not likely that, in the immature state, the parasite would live long apart from the host, it is as well to keep sheep off infested pastures as long as possible, after which the danger would be averted by the death of the immature worms. Curative treatment must be in imitation of that suggested for the cattle stomach worm.

Liver Fluke.—The disease known as liver rot, coathes, iles, &c., caused by the liver fluke (*Distoma hepaticum*), has at times during the past forty years appeared as a scourge. For several years past our flocks have been remarkably free from anything like serious outbreak. It usually follows a succession of wet seasons, and in view of a possible recurrence of wet seasons during the rainy summer of 1903, the Board of Agriculture issued a leaflet of warning and advice as to the prevention of this disease, and in the following year reprinted, by permission of this Society, the scientific articles on this disease which had appeared in the Journal. Happily there has been no recurrence of the losses experienced in the 'sixties and 'seventies.

From the Board of Trade returns it will be seen that from 1879 to 1881 there was a diminution of 3,500,000 sheep in Great Britain, attributed mainly to liver rot. It is difficult to account for the disappearance of the malady. Probably certain special climatic conditions, unfavourable to its development, have obtained; possibly the knowledge of the life-history of the fluke has led to the adoption of successful measures of prevention. Certain it is that the important discoveries of Mr. A. P. Thomas, described in the Journal some twenty-five years ago,[1] which completed our knowledge of the life-cycle of the parasite, contained the information which affords us certain grounds to work on. Though at the present time comparatively little interest is likely to be taken in the subject, we must not overlook the fact that now and again we meet with cases of liver rot, and that flukes are not annihilated. Indeed, a few are frequently met with. Each individual parasite is capable under favourable circumstances of producing innumerable young flukes. This has been variously calculated at from scores to hundreds of thousands, so that, should favourable conditions arise, it is possible for us to experience a repetition of former troubles,

[1] Journal R.A.S.E., Vol. 42, 1881, p. 1; Vol. 43, 1882, p. 439; Vol. 44, 1883, p. 276.

while it is well that such preventive measures as can be, should be taken in the course of good husbandry.

The accompanying illustrations (Figs. 8 to 14), reproduced from Mr. Thomas's articles, indicate the series of changes from deposition of the fluke egg. It will be seen that the egg must get into water and there develop into an embryo capable of boring into the body of a snail. This snail lives only in fresh

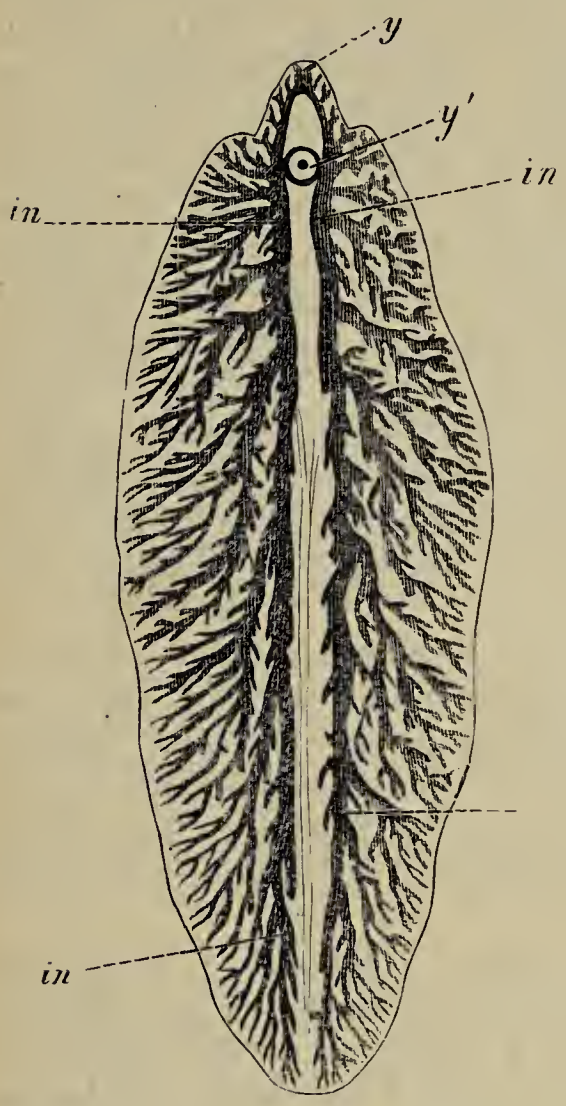


FIG. 13.—An adult Fluke, showing the branched Digestive Tract.

y, the oral; *y'*, the ventral sucker; *in*, the branched intestine. In the centre, between the two main branches of the intestine, lies the chief trunk of the water-vessel. Twice the natural size. (Original.—W.H.J.)

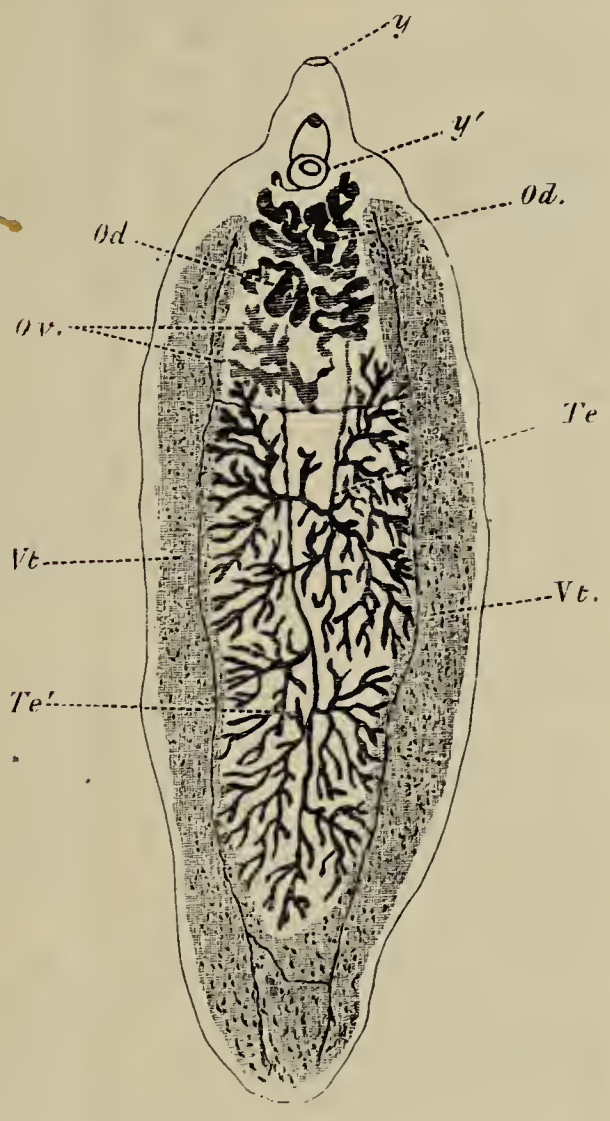


FIG. 14.—Another view of an adult Fluke showing the Reproductive Organs.

y, the oral; *y'*, the ventral sucker; *Od*, the oviduct; *Ov*, the ovary; *Vt*, the vitellarium or gland that forms the granular yolk-cells surrounding the embryo in the egg; *Te*, the anterior; *Te'*, the posterior testis; their ducts run forwards. The generative opening is in front of the ventral sucker. Twice the natural size. (Original.—W.H.J.)

and not in salt water. In the body of the snail, the embryo develops, in three generations, many more, each of which passes out of the snail, and if taken in by the sheep with its food or water, becomes the sexually mature hermaphrodite fluke. The parasite having gained the liver of its host defies removal by any known means.

The mature fluke is flat and about an inch long. While in the liver, the female deposits her eggs, which are carried out and distributed over the pasture with the dung. If the fresh water snail (*Limnæa truncatula*) is available the embryo enters it.

Symptoms.—It has often been stated that in the early stages of the disease the infested sheep puts on flesh and appears to do exceptionally well, and that this is due to increased flow of bile, resulting from irritation of the young fluke creeping up the bile ducts. This improvement in condition may, and probably does, depend on the fact that situations in which the sheep takes in the flukes are most commonly old pastures, which at the time are full of grass owing to the wet weather or flooding which is so favourable to the development of fluke embryos. Soon after this reputed improvement, the sheep loses condition and becomes anæmic, as evidenced by paleness of the membrane of the eye and gums. After a while, the appetite is lost, emaciation is noticeable, there are dropsical swellings, especially under or between the jaws, the abdomen enlarges, the spine becomes prominent (razor back), and the appetite is affected. Should the symptoms subside, recovery will be slow.

Post-mortem examination shows changes almost entirely confined to the liver and the blood. The walls of the bile duct are thickened throughout, giving to the organ a certain hardness to the touch, which may be extreme, owing to deposition of lime salts. Flukes may be found in the large ducts, or if the organ is cut through and squeezed, they will appear on the cut surface.

Prevention.—As there are no known means of expelling the flukes from the bile ducts, the importance of preventive measures is paramount. Moisture is essential to the development of the free-swimming embryo and of the snail (*Limnæa truncatula*) into which it bores. Without the snail, the embryo can advance no further. The surest and probably the easiest way to prevent liver rot is to prevent the existence of this and all other fresh water snails. The snail will not live without water and that water must be fresh. All means should therefore be taken to prevent water standing in ditches, pools, &c., while the application of salt to infested pastures (5 to 10 cwt. per acre), in the autumn, helps to establish conditions unfavourable to its life. Liming of pastures has been freely advocated, but it is difficult to see how this can be of substantial service. Livers containing flukes should be well boiled if to be used for dogs, &c., but under all circumstances the flukes it may contain should be destroyed. Sheep from affected flocks should not be brought on to a place. When

liver rot is detected in a flock, and it seems likely that the disease has been acquired on the farm, it will probably prove most economical to kill the whole flock, as it is impossible to determine what animals may not be infested.

Plentiful supply of good dry food, to which has been added some edible salt and some bitter tonic, may assist the infested sheep to recovery, while it may help to expel any flukes which may happen to be in the intestine. Pastures should not be overstocked, and high ground is preferable.

Parasitic Bronchitis.—Two species of strongyle infest the bronchial tubes or lung tissue of sheep.

Strongylus filaria or Bronchial Strongyle.—This worm of the sheep corresponds so closely in structure, size, habits, and, as far as is known, development and disease-producing characters, with the *Strongylus micrurus* of the ox, that the reader is referred to the account of the latter parasite for details respecting these points. It is, however, to be remarked here, that the parasitic bronchitis, &c., caused by the *Strongylus filaria*, principally affects lambs and yearlings, and rarely adult sheep. Diarrhœa, due to the small stomach worms of the sheep, and parasitic bronchitis often co-exist in the same animal. The fatalities are probably greater in lambs than in cattle.

Prevention and curative treatment must follow on the lines suggested in reference to the bronchial strongyle of the ox.

Parasitic Pneumonia.—The lungs of sheep of the age of one year and upwards may be infested with a very slender worm (*Strongylus rufescens*), which is usually from one to two inches long and of a reddish-brown colour. In its adult form it is not often found in large numbers in the bronchial tubes. The embryos invade the tissue of the lung and set up inflammation in larger or smaller areas rendering them solid. If these solid parts are cut into, and scrapings from the cut surface examined under the microscope, numerous embryos of a peculiar form and parts of the adult worm may be observed. This strongyle then does its main injury by means of its embryos, which get into the substance of the lung, inducing pneumonia, while the effects of the bronchial strongyle are chiefly on the bronchial tubes—bronchitis. These parasites may co-exist in the same animal, but in the adult sheep the more serious results are due to the lung strongyle. The losses from attack of this worm are sometimes very extensive, and the rapid course and fatal results of general invasion of the lung alarming. Probably a large number of isolated cases of death due to the worm are attributed to other causes.

Symptoms.—The symptoms of the disease caused by the lung strongyle usually attract less attention than those caused

by the bronchial strongyle. They will very much depend on the extent to which the lung tissue is invaded by the embryos. The sheep lags behind its fellows, tends to separate itself, is disinclined to move, and pants and coughs after any exertion ; generally there is some thirst. When the lungs are extensively invaded the course is usually short, and death may occur a few hours after indisposition is first observed. When only a very limited area of lung is affected the course of the disease may be protracted, and fresh accession of symptoms follows fresh invasions by embryos. The disease is not always fatal, for lungs of sheep wholly unsuspected during life, are frequently found to contain considerable areas of solid lung attributed to attack of the embryos of this worm.

Prevention.— Concerning the life-history of the lung strongyle we are no more favourably placed than in the case of the other members of the strongyle family. Preventive measures, we think, must follow on the principles suggested in the case of other diseases due to strongyles. In the experience of a good many people the disease induced by the *Strongylus rufescens* is limited to over-stocked sick-sheep enclosures. We have confronted it on Salisbury plain and in other places where wide range of pastures is the rule, but investigation has usually shown that the subjects of the disease have been purchased and not bred in open country.

The consideration of curative treatment does not afford very good grounds for hope. When sheep are showing symptoms of the disease, the lung tissue is invaded by the embryos, and we know of no medicine which is likely to destroy them. Indeed, if there are reasons for thinking many sheep are infested, it is probably best and most economical to have the flock slaughtered. Good dry food is essential, and shelter from cold and exposure should be provided.

Gid, Sturdy, &c.—The affection so well known as "gid," "sturdy," "turnsick," "goggles," &c., is very general and certainly one of the best understood diseases of sheep. The symptoms, so well expressed in the popular names, are due to the presence in the brain or spinal cord of the sheep of a cyst or bladder, the *Cœnurus cerebralis* or gid hydatid. This represents one phase in the development of a tapeworm (*Tœnia cœnurus*) which inhabits the intestine of the dog. The cyst or bladder, which may attain the size of a hen's egg, is filled with a watery fluid, and contains, usually in contact with its inner lining membrane, many heads, each of which under favourable circumstances becomes an individual tapeworm. Each bladder may enclose hundreds of heads, so that if a dog swallowed one of these cysts, it is possible that a large number of tapeworms may develop in his intestines.

Here the hermaphrodite tapeworm becomes full of eggs, and each segment which passes with the fæces of the dog contains incredible numbers. If one of these eggs is taken by the sheep with its food or water it passes to his nervous system and develops into a bladder. The "gid" of the sheep and tapeworm of the dog are therefore dependent on the eating by the dog of the brain of the sheep, and on the sheep eating (or drinking) what has passed from the dog.

As a rule there are only a few animals in a flock affected with "gid" at the same time, but occasionally it happens in a much more serious form. Instances have come under the notice of the writer in which 75 per cent. of the lambs of a large flock have become fatally affected, 300 having succumbed within four months.

Symptoms.—The manifestations of the presence of the hydatid in the brain of the sheep are too well known to require lengthy reference here. These will vary according to the situation and size of the bladder, and may interfere with any function of the brain. Most commonly, movements are abnormal. The affected sheep may move in a circle, step high, or trot; indeed, perform any apparently purposeless or uncontrollable movement. In some cases loss of power (paralysis) is the leading feature. Blindness is not infrequent. Loss of flesh is almost invariable, and if the animal is allowed to live long after symptoms are first observed, there may be bulging and softening of the bones of the brain case.

Prevention.—Our knowledge of the life-history of this worm allows the adoption of precise measures for prevention. All dogs, likely to get on to places where sheep are kept, should be periodically dosed with worm medicines (as areca nut), tied up in a house for a few days, and the droppings carefully swept up and burnt. If all dog owners were to follow this practice, "gid" of sheep would be, indeed, a rare disease. The heads of sheep containing the bladder worm should be destroyed or, at least, thoroughly boiled before being eaten by dogs. The cure may be sometimes effected by surgical operation, *i.e.*, by trephining the bones of the skull and removing the bladder. This is a somewhat favourite performance of mountain shepherds. It is, occasionally, successful, and may be interesting to the operator, but the easier method of prevention by the means suggested is also more economical and worthy of adoption.

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COMPARATIVE ECONOMY OF DIFFERENT METHODS OF HARVESTING CORN CROPS.

THE general conclusion that economy has been effected by each improvement in harvest appliances requires no detailed proof. It is demonstrated by the general adoption of machinery in place of hand labour, and by the successive abandonment of the sickle for the scythe; the scythe for the back delivery reaper; the back delivery for the side delivery; the continuous swathe for the sheaf deliverer; and, lastly, the reaper for the binder. When I was requested by the Editor to write a short article on the comparative cost of harvesting by means of sickles and scythes, reaping machines and self-binders, I felt that mere estimates of comparative cost must in some degree be abortive, owing to the great range of circumstances involved.

There is, in the first place, the difficulty of fixing the money value of horse labour, for to many farmers the employment of horses for cutting grass and corn is in itself a serious objection. It was, for example, thought good management forty years ago to plough up clover land for wheat during harvest, and much stress was laid upon the advantage of a long interval between ploughing the land and drilling. Again, there is always a great deal of work on large farms in connection with horse-hoeing and putting in late roots, as well as in completing summer fallows, which require horse labour; and some of these operations are more than likely to be partially neglected if the horses are cutting grass and corn. Whatever disadvantage there may be in postponing the above descriptions of work must, in some measure at least, be charged against any system of harvesting which monopolizes the horses. The absorption of horse labour is considerable on farms where, in order to keep pace with the maturing of grass and corn crops, two mowing machines and two binders, or more, are required.

To cut 150 acres of grass and 300 acres of corn must mean, even under favourable circumstances, forty working days, or close upon seven weeks, including Sundays, for either four or six horses. It is in some cases possible to work a team of two or three horses a full day upon a self-binder, but when the work is carried on ceaselessly during the whole day, and the men in attendance relieve each other at the dinner hour and other stopping times, the horses must be changed. It is unreasonable to expect a team to work at the requisite speed from six in the morning till seven at night, even with intervals of rest; but when the rule is to keep the machines going with

changes of drivers, a spare team is inevitable. I have gone at length into this matter because I hear of many farmers who use one team of two or three horses all day on these machines ; but it is sounder economy to keep up the pace and work the cutter continuously. If this latter plan is adopted and the amount cut and tied averages twelve acres per day, twelve horses employed on two self-binders will be required for a fortnight to do the work. On twelve-horse farms practically all the team will be needed, even after the earlier interruption for grass cutting. So serious is this interruption of summer tillages, that there are still farmers who prefer to employ men to mow their corn crops in spite of the greater cost. It is such considerations as these which make the relative advantages of hand labour and horse reapers or binders a difficult question.

Still, the general result is in favour of the newer method, whether viewed from actual cash expenditure, or from the points of view of rapidity, certainty, and independence of expensive manual labour.

There are some other trivial objections to the self-binder which its superior merits have silenced. There are, for example, laid and twisted crops which can only be reaped by hand. There is also the objection of tying up clover and grassy herbage, which would dry more quickly if left in broadband. The well-known beneficial effect of night dews, and even of showers, in mellowing and increasing the size of barley are not forgotten by many growers, although the practice of cutting barley with the binder has undoubtedly increased. In some seasons the drawbacks attendant upon self-binders are more evident than in others, but the tendency for many years past has been in their favour.

Relative Cost.

It is not difficult to establish the fact of a gradual diminution of actual cost in cash payments due to each successive improvement. Horses must be maintained whether they are profitably employed or not, and unless they are urgently needed on the land, they are well employed in cutting the corn. The saving on the pay sheet is very considerable and the total apparent cost of harvesting is much reduced.

Hand Reaping.

Reaping by sickle was quite usual from 1850 to 1860, although the reaping machine came first into notice in 1851. In 1852, Hussey's, and Burgess & Key's (McCormick's) reapers were before the public, and by 1857 were coming into general use. At that time much corn was cut by the sickle at a cost of from 10*s.* to 20*s.* per acre according to circumstances, and the work was in all respects excellent. The sheaves were

uniform, all the heads being ranged neatly together, and the butts square. No horse-raking was needed, and gleaners were cheerfully allowed to gather what was left. The crop-ends were broad, and consequently were more liable to injury from sprouting in wet weather than mown sheaves. Oats were commonly set up in gaits[1] separately, and afterwards bound into sheaves and put in stook. Stacks built from reaped sheaves were neat, and the sheaves were alternately laid right and left in order to tie the rick, and, when shaved, the builder's art was exhibited in the well-marked layers. It was a perfect system of harvesting, possessing the usual superiority of hand over machine labour. Looking back to those older times, one cannot but regret the loss of many of the arts of the harvest field: the perfect sheaves, the well-placed stooks, the shaven ricks, and ornamental thatching, all of which have disappeared. The disadvantages were: the expense, and the long stubbles, dear to sportsmen, but wasteful of straw. In some cases the stubbles were mown later.

Mowing Corn.

The scythe was an improvement upon the sickle, and sixty years ago was employed generally. Corn scythes are shorter in the blade than those used for grass, and may be two-handled, or with straight or bent sned or handle. They may be fitted with a cradle or bow to collect the corn and lay it across the line of mowing, or in the line of progress, in which case the heads rest upon straw, and not on the ground. Mowing is best done by a party of three—often man, wife and boy. The man mows the corn, the woman binds it, and the boy makes bonds. A man will mow from one to two acres per day, and a "head" of mowers, that is, mower, tyer, and bandster, form a well-proportioned party. The cost on fair crops is about 10*s.* to 12*s.* per acre if let by piece. The amount done per day was estimated in Stephens' Book of the Farm (1st Edition) as follows:—three mowers, three gatherers, three bandsters, and one raker to do six acres of oats, five acres of barley, or four acres of wheat. At the low wages which were given in 1844 he calculates the cost as 5*s.* 2½*d.* per acre for oats, 6*s.* 3*d.* per acre for barley, and 7*s.* 9¾*d.* for wheat. Work of this description should never be done by day pay, and if let at 12*s.* per acre it is clear that the above ten hands would earn 48*s.* when cutting wheat, or 4*s.* 9½*d.* each, which is reasonable. Barley and oats would be let at a proportionately lower price per acre. Mowing severs the straw two inches above the ground, and it has been shown by direct experiment that

[1] "Gaits" are solitary sheaves, set up separately on their stubble ends, to facilitate drying.—Ed.

the weight of straw per acre is in this way considerably increased. The relative weight per acre of straw would be as follows :—

If cut 2 in. off the ground the weight per acre equals 26 cwt.
" 8 " " " " 23 "
" 12 " " " " 21 "

The scythe therefore secures about 3 cwt. of wheat straw more than the sickle, and that quantity, if viewed as marketable produce, may easily be worth 7*s.* 6*d.* and go far towards paying the expense of mowing. Mown sheaves are better adapted for throwing off wet than shorn sheaves, as they are sharper, and the stooks are pointed like a high-pitched roof. Mowing is an excellent method of harvesting corn, although it has been to a great extent relinquished in favour of reaping machines and binders.

Reaping Machines.

It is not necessary to review the history of the reaping machine, except to recall the revolution which its introduction has caused in harvesting. It gave employment to horses on many farms where they were formerly turned out to grass until required for carting. In other cases, as already mentioned, it, to some extent, interfered with tillages. It cut the stubbles shorter than the sickle, although a little longer than the scythe. It proved a salutary check to the high wages demanded by labourers, and did away with all the preparations previously necessary for housing and feeding itinerant bands of men from Ireland, Derbyshire, and other places. It also reduced the cost of harvesting to a point more consistent with the lower prices of corn.

And yet it must be allowed that the reaping machine has had its day. It is seldom used except for barley, and upon small holdings, on which a mower with reaping attachment may be recommended. The principal interest now attaching to these machines is that of cost in comparison with self-binders, for no one can doubt the greater efficiency of the latter class of machines. Any further remarks upon reaping machines will therefore best be made in contrasting them with harvesters.

Self-Binders.

Twine has now been adopted as the best material for binding, and 3½ lb. per acre at 48*s.* per cwt. works out to a cost of 1*s.* 6*d.* per acre,[1] to which must be added 1*s.* per acre for stooking or setting up. The self-binder has been brought

[1] Mr. Frederick Reynard, of Sunderlandwick, Driffield, informs me that, in his own case, the consumption of binder-twine for five years, 1901 to 1905, amounted to 2·78 lb. per acre. It is, however, advisable to estimate such charges liberally, and my own consumption has generally been about 3½ lb. per acre.—J. W.

to great perfection and it is not necessary in this connection to discuss the merits of rival machines. It is wonderful to witness the perfection of its work and the dexterity with which a good carter manages and keeps it going without let or hindrance. It has been an education in itself to men, and although a highly complicated implement, it is extraordinary to see how it works day after day without serious breakdowns. It possesses all the advantages of the reaper, with some others in addition. There are circumstances in which it cannot be used, but these are rare. On all fairly standing crops the self-binder may be used. It has caused the rounded ridges which at one time were seen on clay arable land to disappear, for neither it nor the reaper can stand the recurring jars of ridge and furrow. It cannot always be used on heavy, laid, or twisted crops, nor on precipitous ground. It is scarcely consistent with small fields and small holdings, where back-delivery reaping machines still find employment.

Cost of Reaping.

We have already seen that cutting, tying, and stooking with the sickle used to cost from 10*s.* to 20*s.* per acre, and it has even been in some circumstances as high as 25*s.* per acre. Mowing, tying, stooking and raking wheat were estimated as costing 12*s.* per acre. We have now to endeavour to find the cost of cutting by reaping machines and by self-binders, and once again we are confronted by the horse question.

If horses are charged simply at bed-rock price, or what they absolutely cost the farmer, they may be demonstrated to entail an expenditure of 25*l.* per annum, including risk and depreciation upon an average value of 45*l.* This does not include attendants' or teamsmen's wages, because these are paid for separately. This equals an average cost of 1*s.* 8$\frac{3}{4}$*d.* per day, spread over 290 working days. The question is, Are we to charge horses cutting corn at the average cost of their maintenance throughout the year? I prefer to charge horse labour at two rates, one for summer and one for winter, and to divide the total cost as follows :—

	£	*s.*	*d.*
Two-thirds of total cost for the summer half year . .	16	13	4
One-third of the same for the winter half year . .	8	6	8
Total cost . .	25	0	0

This works out exactly to 1*s.* 0$\frac{1}{8}$*d.* per day for the winter half, and 2*s.* 0$\frac{1}{2}$*d.* for the summer half year. It is bed-rock cost, and appears to me the only way of charging horses for work done on the farm for the farmer's profit. It is what the horse costs, making allowance for the fact that we are justified in placing a higher charge for summer than for winter work.

On this ground I would charge horses engaged on self-binders at 2*s.* 1*d.* per day, but to meet criticism will in this case allow a higher figure. I shall therefore, considering the arduous nature of the work and the long days, allow 2*s.* 6*d.* per day for each horse, feeling that the 5*d.* per day thus conceded will not materially increase the cost per acre of the work.

The question as to whether two or four, three or six horses are required to draw a binder has already been discussed. I prefer three horses abreast, with three in reserve, and to keep the machine going continuously. Two men accompany each machine, one to drive and one to sharpen knives and cut round corners, and to take turns on the machine. On flat land two horses at work and two resting will be sufficient, but not on hilly fields. Two estimates appear necessary, one for four horses and one for six, and having arranged these points we can now venture upon a statement of cost.

Cost of Self-Binders per Day.

	With four horses, or two pairs worked alternately			With six horses, or two three-horse teams worked alternately		
	£	*s.*	*d.*	£	*s.*	*d.*
Horses at 2*s.* 6*d.* each. . . .	0	10	0	0	15	0
Two men at 4*s.* per day . . .	0	8	0	0	8	0
One boy to water and attend to horses	0	2	0	0	2	0
42 lb. of binder twine	0	18	0	0	18	0
Oil	0	1	0	0	1	0
Use of emery grindstone	0	1	0	0	1	0
Interest, wear, tear, and repair at 20 per cent. spread over twelve days on 35*l.*[1]	0	11	8	0	11	8
	£2	11	8	£2	16	8

Twenty per cent. may appear a heavy charge for wear, tear, and repair, but the effective life of a self-binder cannot be placed at more than five years, although repairs and renewals may still preserve the machine effective, and therefore of value. I consequently hesitate to charge a lower figure for these items.

The amount of work done in one day varies from ten to twelve acres, and both divisors may be employed according to circumstances.

	Cost per acre with four horses		Cost per acre with six horses	
	s.	*d.*	*s.*	*d.*
When ten acres are cut per day. .	5	2	5	8
„ twelve „ „ . .	4	$3\frac{2}{3}$	4	$8\frac{2}{3}$

To these estimates must be added 1*s.* per acre for stooking; so that the total cost of setting up corn amounts to from about 5*s.* 4*d.* to 6*s.* 8*d.* per acre.

[1] Harvesters vary in price from 25*l.* to 37*l.* each, but many leading makers quote them at 35*l.*

Cost of Reaping Machines per Day.

The principal item in this system is the cost of binding, stooking, and raking after the machine, which seldom is less than 4*s.* 6*d.* per acre, and occasionally in the fen district is as high as 8*s.* Medium crops of wheat are tied and stooked for 5*s.* 6*d.* per acre, and this figure may be assumed as fairly representing an average. Reaping machines, being less complicated than binders, last longer and require fewer repairs. Two or three horses are required, and a relay will also be advisable in order to keep the work going constantly throughout the day. The binder twine is also saved. The estimated cost will therefore be :—

	With four horses worked alternately	With six horses worked alternately
	£ *s.* *d.*	£ *s.* *d.*
Horses at 2*s.* 6*d.*	0 10 0	0 15 0
One man driving	0 4 0	0 4 0
One man cutting corners and sharpening knives	0 4 0	0 4 0
One boy	0 2 0	0 2 0
Oil	0 1 0	0 1 0
Use of emery grinder	0 1 0	0 1 0
Interest, wear, tear, and repair on 26*l.* at 15 per cent., spread over twelve days	0 6 6	0 6 6
	£1 8 6	£1 13 6
Cost per acre if twelve acres are cut	0 2 4½	0 2 9½
Add cost of tying, stooking, and raking, let by piece	0 5 6	0 5 6
Total cost	£0 7 10½	£0 8 3½

The difference in cost in favour of the self-binder appears to be about 33 per cent. On the basis of twelve acres in either case it amounts to 2*s.* 7*d.* per acre. The advantage of the binder will be more apparent when the price paid for tying, &c., is above 5*s.* 6*d.* per acre.

Actual Cost of Different Systems.

It is impossible to contrast past and present, as the circumstances are totally different. We could not obtain labour for hand reaping even if we wished, but in recent years when crops have been very much laid and twisted, 1*l.* per acre has been paid. Mowing is more frequently used, but entails a cost of 12*s.* per acre. The same work done by the reaping machine is reduced to 7*s.* 10½*d.* or 8*s.* 3½*d.* per acre, and if done by the self-binder to 5*s.* 4*d.* or 6*s.* 8*d.* per acre.

Back Delivery Reaping Machines.

The "reaping attachment," or combined reaper and mower, is used on small farms in which the area under corn would not

warrant the heavy expenditure required either for a reaping machine or self-binder. Two men are required on the machine and two seats are provided. A two-horse mower fitted with reaping attachment, costs 16*l.* 10*s.*, and the wear and tear on such implements must therefore be at least proportionately less. The cost per acre depends upon the area cut, which may be assumed at nine or ten acres per day. The draught being lighter and the holdings being small, two horses will suffice.

	£	*s.*	*d.*
Two horses at 2*s.* 6*d.*	0	5	0
Two men at 4*s.*	0	8	0
One spare man to cut corners and sharpen knives, at 4*s.*	0	4	0
Oil and files	0	1	0
Interest, wear, tear, and repair, at 15 per cent. on 16*l.* spread over twelve days	0	4	0
	£1	2	0

The cost per acre for cutting nine acres per day would therefore be 2*s.* 5⅓*d.* per acre. These machines are back delivery, and the sheaves must be taken up and tied at once, as otherwise they would be trampled upon by the horses; this sometimes delays the work and may render nine acres per day sanguine. If we estimate the cost of actual cutting at 2*s.* 6*d.* and add 5*s.* or 6*s.* for tying, stooking, and raking, the expense will amount to from 7*s.* 6*d.* to 8*s.* 6*d.* per acre.

Other Harvest Appliances.

Not only have harvesting operations been cheapened by the introduction of reaping and binding machines, but also by the use of improved horse-rakes and elevators or stackers, which help further to save manual labour and diminish cost. The total cost of harvesting corn crops was estimated by the late Mr. J. C. Morton in 1868, as it "may be conducted," as follows :—

	Per acre *s.*	*d.*
Cutting by machine, tying, and stooking	6	0
Pitching and loading	1	0
Rick building	0	8
Carrying	0	8
Thatching	1	4
	9	8

Mr. Morton also wrote : "As it is actually still conducted (1868), unavoidably indeed, in many instances, owing to a bulky and late crop, the reaping alone may sometimes cost 15*s.* to 20*s.* per acre—the carrying and building may cost 3*s.* or 4*s.* more—the thatching 1*s.* per square, may cost rather

more than 1*s.* per acre ; and, in all, the expense of harvesting may be more than double what has been named."

These remarks are still wonderfully true in spite of all the improvements ; but it is not too much to say that notwithstanding scarcity of labour and higher wages the total cost of harvesting may, with the help of self-binders, be executed at about the same cost that Mr. Morton estimated it at in 1868. Personally, I think Mr. Morton's estimate of 2*s.* 4*d.* for pitching, loading, and carrying too low, even under the best possible management, at the time in which he wrote.

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AGRICULTURAL WEIGHTS AND MEASURES.

"IN the beginning was Chaos," wrote Hesiod, earliest of agricultural critics. He was not speaking of our present theme, but he easily might have been and he might no less easily have connected it with that agricultural depression upon which he was fond of dwelling. In his day, as in ours, agricultural weights and measures were in a state of all but hopeless confusion ; in his day, as in ours, farmers were the losers by this confusion, yet did very little to remedy it. That something like 2,700 years have elapsed without the civilised world making any sustained effort to facilitate barter and exchange in the greatest of its industries is amazing ; yet such is the fact.

The ancient Greeks were so enterprising in their geometry that the very name for its earlier books is that of a Greek, *Euclid*, and their love of proportion has never been equalled by later races. Yet their agricultural weights and measures were inextricably confused, and we need not now study them, seeing that, like certain words, they "admit of no defence." Their method of progression seems to have been 1 : 15 : 60 : 180 : 8,040 ; and the only explanation of such want of order must be that the middlemen then, as now, thought that they gained by making barter a mystery and that then, as now, they had the whip hand both of consumer and producer.

The ancient Romans had a system rather like ours, for their *modius* was practically a peck, their *semimodius* was practically a gallon, and their *sextarius* was practically a pint. Then they suddenly went off into the scale of 12, and a *cyathus* was the twelfth of a pint.

That the barbarians introduced nothing like uniformity goes without saying. But that the subtle Arabians who gave us their figures never hit upon a working system for

the regular sale of produce adds to the surprise felt at the Grecian failure. The Arabs may even claim to have introduced a new disturbing element in their system of reckoning agricultural areas by *ploughs*. Even in the middle ages there were improvements in ploughs, and the number needed to the mile would also vary with the traction, by strong horses or oxen in some places, by women slaves in others. In India the system is now to reckon by a joint weight. An English pound is the basis, and eighty of these makes a *maund* which is an extremely convenient weight for the ryot, about as much as he cares to carry. We then get back to the English quarter, six maunds making a quarter. This system works well and is extending to the Native States.

We have thus far no clue to any definite system at all and search must take what nowadays is an unwonted course. We must quit the inductive for the deductive. Here we at once find something interesting. Trouble appears to have begun in prehistoric days when primitive man commenced reckoning his thumbs as fingers. The earliest basis of civilised reckoning was clearly the digit, and if the human race had reckoned by eight fingers instead of ten—and eight *is* the number, not ten—a perfect system would have been evolved. Eight, as the older mathematicians pointed out, is the perfect number, not because it is the number of the Beatitudes as the schoolmen quaintly put it, but because it divides out : half of 8 is 4, half of 4 is 2 and half of 2 is 1. There are no broken numbers, whereas, half of 10 is 5, an unbroken number ; but half of 5 is $2\frac{1}{2}$, and half of $2\frac{1}{2}$ is $1\frac{1}{4}$, two broken numbers in the scale. Mr. H. G. Wells, in one of his clever novels, has forecast a scale of 8, and this reversion to a mediæval truth has been called "one of the wildest of his fantasies."

Of this scale of 8 we have an odd survival in the shipping trade, which in all countries divides a ship into a maximum of 64 shares$=8\times8$. We believe that *The Times* newspaper shares are similarly divided, the first Mr. Walter having started in the shipping trade. Other traces are to be found in the 8 pints to the gallon, in the 8 half crowns to the pound, in the 8 drachms to the ounce, and in the 8 furlongs to the mile. If we could establish a scale of 8, it would solve all our difficulties. We imagine, however, that no serious controversialist will suggest the enforcement of a scale of 8.

The scale of 12 has its practical advocates. Its weakness, of course, is in the last stage of dividing out. Half of 3 is $1\frac{1}{2}$, a broken number. The scale of 10 (the decimal system) has two weaknesses to this one. Where the 12 scale fails is in the higher figures : $12\times12=144$, the *gross*, is the highest that children usually reach, and few grown men could answer

offhand what was 144×144; whereas 100×100 is no long puzzle even to the slowest intellect.

Nobody has ever defended scales of 7 or 9; because they fail on the first divisional attempt. The elimination of all odd scales—we use the word, of course, in its literal sense—is therefore the first step of reform, one that even ultra-conservatives may be expected to support. Let All Souls' College, Oxford, Winchester College, and Eton College give up their 9 gallons to the bushel, and the Port of Looe its 18 gallons (9×2) to the bushel.[1] The seven days to the week, however, apparently enshrine the 7 scale in an impregnable position.

The fact that 8 bushels make one quarter constitutes a serious obstacle to reform. It is curious that this should be so; but as the French say, "the good and the better are always enemies." We must give up the convenience of this perfect scale, however, because it cannot be worked out at either end. We can never get 64 lb. to the bushel as a fixed weight, and 8 quarters to the ton would be "Irish" indeed. A 2-ton *unit* might be brought in, but it would have to consist of 4,096 lb., which is a very unwieldy quantity. Moreover, the bushel is primarily a measure, and local traditions and usages mostly attach to this view of it. Bushels are simply *boxes*, the monkish Latin word *bussuli* meaning both boxes and in a technical sense bushels. Our word "bushel" is simply this *bussulus* anglicized.

The bushel or box is the most diverse of measures. The following are the chief bushels in present agricultural use :—

1. The Monmouth wheat bushel of 80 lb. No wheat ever did or could weigh 80 lb. to the bushel, so that this must be an utter corruption and misuse. We suspect that the agriculture of the region was so bad that 80 lb. of corn had to be delivered to secure, on sifting, 60 lb. of clean wheat. These abnormally large bushels never occur in wheat regions proper. 2. The Chester wheat bushel of 75 lb. 3. The Aberystwyth wheat bushel of 65 lb. These three bushels used in the west and in Wales should be given up; they serve no useful purpose whatsoever. 4. The Mark Lane wheat bushel of 63 lb. This prevails in the chief wheat counties, including Lincolnshire and the Eastern Midlands, East Anglia, and Essex with its former dependencies of Middlesex and Surrey, also in Kent. It is likewise the usual standard for all sales of beans, peas, tares, lentils, lucerne seed, &c. It has not been superseded by (5) the statutory bushel of 60 lb., which is the usual standard for maize, dari, rye, millet, American, Canadian, Australian, New Zealand, and Argentine wheat. The last named, however, weighs over 60 lb. as a rule, and the surplus is deducted on

[1] Thorold Rogers, *History of Agriculture*, Vol. VII.

delivery. The 6th of the more frequently used bushels weighs 58 lb., and is used for canary seed.

Others may be briefly detailed :—

7. The 56-lb. bushel.—Wheat when sold for chicken and other feed ; barley when sold for malting ; potatoes.
8. The 53-lb. bushel.—Rapeseed when home grown.
9. The 52-lb. bushel.—Rapeseed when imported ; linseed ; buckwheat.
10. The 50-lb. bushel.—Barley when sold under the Act of 1882, but otherwise only when sold for feeding purposes.
10. The 48-lb. bushel.—Gluten meal.
11. The 47-lb. bushel.—Poppyseed ; sesame.
12. The 45-lb. bushel.—Mangels ; Swedes ; Turnips.
13. The 42-lb. bushel.—Malt ; English and Scotch Oats, except when sold under the Act of 1882 ; torrified wheat and barley.
14. The 40-lb. bushel.—American oats ; Canadian oats ; carrots.
15. The 39-lb. bushel.—Oats when sold under the Act of 1882.
16. The 38-lb. bushel.—Russian, Roumanian, and Turkish oats ; undecorticated cotton cake.

Here we have sixteen bushels all in weekly market use. Numbers 1, 2, and 3 are archaic and have long survived their purpose, while number 15 is a recent statutory creation which has "failed to please."

Similar perplexity attends the load in pastoral agriculture, for a load of new hay weighs 19 cwt. 32 lb., a load of old hay 18 cwt., and a load of straw 11 cwt. 64 lb. The railway companies are practical reformers in this matter and will only recognise the ton. Great good has been effected in recent years by this firmness of the different traffic managers.

Passing from weights to measures, that is to say, to reckoning by the space or area occupied, we find that the ordinary measure of capacity is 4 gills 1 pint, 2 pints 1 quart, 4 quarts 1 gallon, 2 gallons 1 peck, 4 pecks 1 bushel, 8 bushels 1 quarter. This is an octave, or system of 8, the original formula being inclusive of a 2-bushel measure which has dropped out. Or the formula may have continued from 4 pecks 1 bushel, 4 bushels 1 coomb, and 2 coombs 1 quarter. The coomb is still in use in East Anglia and contains 4 bushels, but it is usually regarded as a Danish peculiarity of this very Danish part of England. The word is said to be the early English *cumb*, which means a cup, but Professor Skeat is not a safe guide on agricultural derivations. A coomb consists of a quantity never associated with even the largest cups.

Unusual local measures perplex by their diversity in comparatively restricted areas. Thus, there is the *boll*, a word the use of which is said to follow where the Scandinavians held sway. We find it at Newcastle, Carlisle, Darlington, Berwick, Duns, Kelso, and Glasgow as still the ordinary measure by which corn is sold. But the Berwick boll is double a Newcastle boll, and it takes four Carlisle bolls to make

three Glasgow ones. The seven very important markets which use these divergent bolls should unite on their abolition.

Unusual local weights may in some cases have originally been measures, but as a fixed quantity is now legally due by local custom they must be treated purely as weights. They include the *windle* of Preston and the *hobbet* of Denbigh, the first of 220 lb., the second of 168 lb. Neither fits in with any recognisable scale or table, though the last named may be a 3-bushel measure where the bushel was 56 lb. It is a curious feature of this *hobbet* that twelve of them make the exact and very odd weight of 2,016 lb., which is said by some to be the original *chaldron*, of which 504 lb. is the quarter. As 504 lb. constitutes the old East Anglian quarter, the matter may repay further research. The subject has been alluded to quite recently (*The Standard*, October 1, 1906), but no evidence beyond old farmers' hearsay is apparently adducible thus far. On this hypothesis the hobbet may have been a sack, for in selling lime and some other articles, twelve sacks still make a chaldron.

A very large proportion of transactions is put through in the agricultural world by avoirdupois weight, which by its name reveals its French origin. This weight in its modern form is singularly cumbrous; 16 oz. which make 1 lb. and 8 stones which make 1 cwt. seem to be survivals of the octave, while the 20 cwt. which make 1 ton appear to belong to the decimal system. The 14 lb. which make 1 stone appertains to a rare and probably religious and astronomical scheme of 7 which we may call the Septet. The history of this weight, which we owe to the Plantagenets or to the Normans, would require more research than we can give to it, and its utterly amorphous character renders its abolition a crying necessity. Its continued employment costs may thousands of pounds yearly in cumbrous account keeping. Among bodies still using it for agricultural tables, are the Irish Department of Agriculture, the British Custom House, and the Conservative Central Association in their *Constitutional Year Book* for 1906. The latter, however, in their 72nd fiscal table adopt the useful unit of pounds, raising the unit to a million by pointing off six figures to the right.

An old Scots' scale of 8 is decidedly interesting. It is not yet extinct :—

4 lippies	=	1 peck.
4 pecks	=	1 firlot.
4 firlots	=	1 boll.
2 bolls	=	1 quarter.
8 quarters	=	1 chalder.

In this rather elaborate system where *the* quarter is not *a* "quarter" of anything, though there are three items out of

five which go by quarters, may, I think, be found something like evidence that the quarter of corn has nothing to do with *quartus*.

In the butter trade the scale of 7 appears to be the clue to the perplexing firkins, tubs, and barrels which weigh respectively 56, 84, and 224 lb. and fit into each other singularly ill. But the firkin contains 8, the tub 12, and the barrel 32 units of 7 lb. each.

Two peculiar reckonings prevail in East Anglia. By one, the peck at a corn chandler's is reckoned at 15 lb. of wheat, 14 lb. of malting barley, 13 lb. of poultry barley, and 10 lb. of oats (320 lb. to the quarter). The railways serving Eastern England used to reckon 5 quarters of wheat, beans, or peas to the ton of 2,240 lb., 6 quarters of barley, 7 quarters of oats, and $7\frac{1}{2}$ quarters of malt. Asylums might be filled by people attempting to make this logical, but the fact is that a free margin was allowed in order to attract custom. The system has long since been replaced by the ton, as trucks run into tons in their capacity, and trucks are the real railway unit. The old railway allowance may, however, still crop up in returns of quantities delivered at markets by rail. We refer of course to Victorian records.

With reference to a possible decimal system based on the present *pound* it may be noted that a unit of 10,000 lb. would probably suit the railways peculiarly well as, if it were in a legal scale, the trucks could easily be built to that capacity. There are at present a variety of trucks, but the smallest holds 8,960 lb., and the largest, we believe, 15,680 lb. It is not absolutely impossible that the railway companies, amid their present rivalries, might be glad to see compulsory uniformity of a certificated 10,000 lb. capacity truck.

Mr. Primrose McConnell has usefully pointed out that to get pounds into hundredweights we have to multiply by ·00893, a fact in itself surely sufficiently condemnatory of the avoirdupois system. If there is anything still less defensible the milk trade of the Midlands supplies it with its "barn gallon" of 17 pints. To lay upon humanity the burden of a high indivisible number like 17 is an offence for which there surely should be "imprisonment without the option of a fine."

In the *Mark Lane Express* for October 22, 1906, we have the argument for trying to grow malting barley put as follows :—

> "The fault is not with the price which maltsters and fine ale brewers are willing to pay. Their buyers are commissioned to pay a penny per lb. for the fine bright types of barley, whereas wheat at present fetches only ·67 of a penny per lb., and oats are ·63 of a penny per lb."

Surely this is clear enough. The farmer feels instinctively that the first course open to him means 100 sovereigns where the second means 67 and the third 63. Once established as a scale of comparison, the decimal system may almost be said to do its own translation into whatever sum or quantity is most familiar to each individual in his own transactions. The poor will at once grasp the difference between the article a pound of which costs a penny and the article a pound of which costs less than a penny, while the well-to-do who think, as we may say, "in consols." will with equal readiness perceive what values are above and below *par*.

There is another complication introduced very gratuitously by the mints, and we must observe in passing that this is no excursus into a non-agricultural matter, but is vital to the main subject. Farming is a trade as well as an art. Crops are grown for money, and diversities in money remuneration, already made bad enough by so odd a scale as 12 and 20 mixed, are rendered far worse when diversities in the intrinsic value of the money assert themselves. Cannot the chemists find a method of hardening gold and silver for trade use and so give us pure money? At present only China has this. Thus the respective finenesses of seven leading coins are as follows :—

1.	The Sovereign	·916667	fine, or pure	gold
2.	The Dollar	·900000	,, ,,	silver
3.	The Franc	·900000	,, ,,	,,
4.	The Rupee	·916667	,, ,,	,,
5.	The Guelder	·945000	,, ,,	,,
6.	The Tael.	1·000000	,, ,,	,,
7.	The Rouble	·868060	,, ,,	,,

For the first five of these we are indebted to Mr. Norman's *Cambist* (London, 1897), and Mr. Norman, an apologist of the mints, apparently in this respect, though not in others, dismisses the tael as a weight. Is alloy necessary to make a coin? Of course one concedes that a big and rapid trade would render soft metal impossible. But, as already remarked, has the possibility of a chemical hardening of precious metal been considered? The degradation of the rouble will be noted; our figures are derived from a Russian official source. The Bank of England will buy gold in unlimited quantity at 3*l*. 17*s*. 9*d*. per ounce of pure metal. It only makes a penny profit on the transaction.

The Uruguayan system is one of inconvertible paper. In this case the difficulties of alloy are, together with many other troubles, such as wear and tear, &c., escaped; but the value of the paper depends on the national honour; and here again infinite diversity makes its appearance.

The ratio of silver to gold is a further source of market diversity. Japan, the latest country to grapple with this

thorny matter, has issued 20-*yen* gold pieces showing a ratio of 32·347 of silver to gold. The "Silver Democratic Party" in the United States wear as badge a numeral, 16, indicating that if they got the upper hand they would make the ratio 16 to 1. Thus there is an extreme range of 16·347, more than 2 to 1.

In India there exists by statute (Act of June 26, 1893) a mythical gold rupee, but the silver rupee remains unlimited legal tender. Thus, as Mr. Norman points out, India has no standard, neither can the ratio of gold to silver be stated; but "the constant 382·29546 annas, being divided by the price of silver of the day in annas, gives the ratio between the metals." Who can wonder that India is the country par excellence of small monetary litigation?

Brewers appear, at a date which goes back well into the middle ages, to have struck upon a scale of 9×2, which is, wherever met, the remains of an older system of 9×8. The present scale is 9 gallons 1 firkin, 2 firkins 1 kilderkin, 2 kilderkins 1 barrel, 2 barrels 1 puncheon. Hogshead, butts, and tuns do not properly belong to this scale.

In the sale of wool we have three entirely distinct scales in present use. It is well that the sale per pound has already superseded the old scales in most places and is gaining ground steadily. Nevertheless the old systems are in their own haunts living and even robust. The first scale is Scandinavian and still rules mostly where the Norsemen came in force:—

7 lb. = 1 Clove.
2 Cloves = 1 Stone.
2 Stones = 1 Tod.

The word *tod* simply means a big bush which a bundle of 28 lb. of wool resembles. The old name of tod for a fox is due to his big bush of a tail. Then we have the English 20 lb. = 1 score, and 12 scores = 1 pack, which still is sufficiently correct; and finally there is the scale of 2 weys = 1 sack, and 12 sacks = 1 last. The word *wey* is usually 182 lb. I suspect this scale to be Celtic, and, though Professor Skeat derives wey from *wagen*, I look upon the *wey* as originally rather a measure than a weight. "Last" is probably from the Celtic *luth*, strong, and represents the heaviest weight or largest measure, the maximum in fact of any given scale.

There are four weys of cheese—the Common, which is 250 lb., the Suffolk, 256 lb., the Sussex, 336 lb., and the Essex, 416 lb. This looks as if the *wey* was not really understood in the purely English east and south-east.

An ingenious friend at Mark Lane, having remarked that the measure was useful because it allowed the use of a box of regular size, the writer made inquiry and found that a *bin* to hold one quarter of corn has the following dimensions:—

Length, 2 ft. 9 in.
Width, 1 „ 8 „
Depth, 2 „ 4 „

This does not strike us as extremely commodious. How many quarters could be stored in a barn 40 ft. by 20 ft. and 20 ft. high? It does not seem to work itself out at a glance. Measures have not been defended in recent Acts. Those of 1824 and 1882 are based on weight as the unit.

The history of the quarter as the legal unit is interesting. It is referred to as the quantity by which wheat is to be priced in the following statutes :—

1155 (?). Henry II.'s Assize of Bread ;[1]

1463. Act 3 Edward IV., c. 2 ;

and in so many statutes since 1463 that it may fairly be called the national wheat unit since then. It is frequently given in the thirteenth and fourteenth centuries as the ordinary wheat standard, so that there is continuity of record right back to the days of Henry II. Yet nobody, as we have seen, seems to know of what it is the quarter. Is there any possibility of its original meaning having been merely a measure of *grain*? The Aryan root GAR, to grind, is found in *quern* and other words connected with grain, including, of course, grain itself and *garner*. The termination *-ter* is perhaps the most common of all the Aryan formulæ for converting a verb into a substantive.

Now it will undoubtedly be difficult to abolish the bushel and the quarter ; but there is happily a weight which is of universal acceptance, the establishment of which as the legal compulsory weight, without whose indication a contract would not be legally enforcible, would excite no opposition, but would be accepted as in the natural order of things. Without this lever one feels that nothing could very well be done, and for want of some such lever probably the old peoples failed. "Give me a lever," said Archimedes, "and I will move the world." This lever is *the pound*. The present writer would respectfully urge upon the Board of Agriculture and Fisheries the publication of all its returns in pounds as a preliminary, and afterwards the promotion of a Bill in Parliament requiring all sales of agricultural produce to indicate the quantity in pounds as a condition precedent to their legal enforcement.

There is a difficulty, and one only, to this policy. It is that the pound being a small unit for wholesale transactions, very large figures would have to be remembered. Most of us can remember that an average wheat crop in the United Kingdom nowadays is about 7,000,000 quarters, but how many, it is asked, would remember that such average crop was

[1] *English Industry*, by W. Cunningham. University Press, Cambridge, 1896.

3,360,000,000 pounds? The answer is easy. Even in the primary schools the system of decimals is now taught, and the youngest sailor boy in the Navy understands a "four point seven" (4·7) gun. The way in which the English word "point" has already superseded the Latin word "decimal" in the vernacular shows that this amount of knowledge, at all events, has been, for good and all, assimilated by classes and masses. We have, therefore, simply to point off for ordinary use exactly as many points to the right as the degree of wholesale business requires. This facility is itself a strong recommendation. Thus the corn chandler might find it suit his books to point off one figure to the right and reckon in stones or bags of 10 lb. The smaller dealer in Mark Lane would find the 100-lb. unit more convenient, and would point off two figures to the right; while the larger operators at the Baltic would find a great relief to eyesight, if to nothing else, in a 1,000-lb. unit, which would save the present working in half-penny and farthing differences in prices. They would point off three figures to the right; then, and finally, statisticians dealing in millions would point off six figures to the right. The British average wheat crop would be familiarly known as 3,360—four figures to quote—instead of 7,000,000—seven figures to quote.

We may indicate that this is so easy a system in practice that it has been in vogue in certain directions for some time past without exciting comment. It is, in fact, one of those things into which every person of the least education falls at once. Thus, in *The Field* (November 25, 1905), we have the world's crops summed up in a table where the unit is millions of quarters. The United States Government, in its Blue Book for 1904, gives the agricultural areas to the hundredth of an acre; thus, the Colville Indian Reserve is given as 8,752·96 acres. In the Agricultural Returns issued by the Board of Agriculture, July 21, 1906, the agricultural areas are given in millions of acres to two places of decimals, and the yields per acre to two places of decimals in bushels. In each case, of course, one points off two figures to the right. Dr. Mill's "Rainfall for 1905" gives the fall in inches to two places of decimals, and this is the degree of accuracy that is observed in the returns to the daily press, for rainfall, and also for the barometer and thermometer.

Outside agriculture we have the sporting press, with its frank reliance on "the man in the street," giving cricket averages to two places of decimals. The very newsboys perfectly understand that Hirst's 55·94 for 1905 is better than Quaife's 55·66. The clue to the ease with which the mind works out these figures resides in the eye, which glances

by instinct at the first figures to the left and appreciates thereby the main issue involved. Thus the cricket enthusiast grasps first the interestingly close competition between Hirst and Quaife in 1905, and then goes on at his leisure to the minor question of the small difference in the former's favour. A similar system has only to be enforced in agricultural transactions for a very brief period, and people will be wondering how it was that they put up with the old confusion, the old loss of time and patience, the old complicated book-keeping, the old delay.

Within the last few months an important step in this direction has been taken at Birmingham by Messrs. Kynoch, whose business has been, since November 1, 1906, carried on by means of the decimal system. In the *Daily Express* for October 17, 1906, appeared an interesting explanation of their reasons for adopting this system. They reckon the losses to British commerce by our confusion of systems at millions of pounds sterling annually. An accountant, writing to the same paper (October 19, 1906), stated that opinion is steadily growing in favour of the decimal system, and that the step thus taken would mitigate "a worry hampering men of business all through life." He continued :—

"The decimal system, with its easy method of moving a dot to the left and right and getting an instant correct answer, is much preferable in every way. At the present time we work our accounts and the returns from every department out to two places of decimals, so we know to the least hundredth part exactly the prices we can buy and sell at. Many business houses only work these returns out to eighths, which means a great difference when dealing, as we do, in large quantities. By our exact method we can buy so as to sell to give our customers the greatest possible advantage."

These remarks were endorsed in subsequent letters by other representatives of large business houses. The letter from Lord Belhaven and Stenton (October 20, 1906), emphasized the great saving of school time which would result. This point might even have been made greater had his lordship remembered how crowded is the modern curriculum. The London Chamber of Commerce and the London Trade Protection Association approve the change. A "Rugby Conservative" whose objections found voice somewhat amusingly in a Radical journal, thought the change ought to be opposed, because it would entail upon shopkeepers the cost of new weights (*Daily Chronicle*, October 27, 1906), but at this rate hardly any reforms would be possible. A more real conservatism would, one fancies, be found in the dictum of Mr. Acland, that "the metric system is sure to be adopted sooner or later by this country, wherefore the sooner we make up our minds to make the change the better will be the result" (*Tribune*, October 26, 1906).

The great question of international weights and measures is beyond our present scope ; to undo that occurrence at Babel will require theological virtues which international statesmen do not at present appear too particularly to exemplify. A step or two has been taken. The world has one system of degrees of latitude from the equator to the poles. It has adopted the scale of 8 for books—a folio, a quarto, an octavo : these are the terms on the Continent as well as here, and indicate the same sizes. But no recent progress has been made. It is, however, in the daily business of life, and especially in its verbal transactions that uniformity is valuable. Once establish a decimal system based on the pound for the British Commonwealth, and a penny card of indestructible ivorine the size of a visiting card would serve to carry the necessary title for instantly indicating the foreign counterpart to our fixed English weight of the pound and its tens, hundreds, and thousands.

The pioneer of effective reform, if ever reform comes, will have been the late Mr. Jasper More, M.P. for the Ludlow Division of Shropshire. His labours have perhaps their best embodiment in the article on "The Sale of Corn by Weight," which appeared in this Journal in 1891.[1] The gist of the whole is in the declaration by a highly placed Government servant (the late Mr. H. J. Chaney), whose many years of experience in the Standards Department of the Board of Trade led him to say : "I have no doubt that it would be far better and that it would avoid a great amount of trickery if corn were required to be sold by weight only." Mr. More's own views were marked by decided moderation and by no common foresight. He anticipated the failure of the Government quarter of 312 lb. for oats ; he held out the right hand of co-operation to France, and through France to the Continent ; he appreciated, with Mr. Chamberlain, the cental or true hundredweight ; but he was a little too pessimistic as to its gaining ground. He agreed with Mr. Chaney that "the tendency of the human mind is to halving," a tendency for which the present article has endeavoured to show the underlying reason. He made the road easier for all future reformers, who would indeed be ungrateful if they forgot to recall and honour his services.

CHARLES KAINS-JACKSON.

18, The Green,
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[1] Journal R.A.S.E., Vol. 52, 1891, pp. 717-729.

IMPURITIES IN MILK AND BUTTER.

NEVER, I suppose, within the memory of the present generation has the attention of the civilised world been drawn so forcibly, as was the case in 1906, to the consideration of the cleanliness and purity of various kinds of foods which are in daily demand, especially amongst the poorer classes.

The gruesome details narrated in *The Jungle* of the doings in the large canned meat factories at Chicago, corroborated as they have been, in a certain sense, by the action of the President of the United States, have set the public thinking not only of the purity of the various tinned and preserved foods that are sold everywhere, but also of those other foods, like bread, meat, milk, and dairy produce, which may be classed as manufactured, inasmuch as they require manual labour expended on them before they can be placed on the market.

Milk and butter being two of the most important of such foods, I need not apologise for dealing only with them, as both have been very much in evidence during the past few months, scarcely a week passing without something appearing in the Press on the impurities of milk and the adulteration of dairy produce; while the Report of the Select Committee on the Butter Trade is, I venture to think, a sufficient justification for including that article of food in my remarks.

And, first of all, I would draw attention to what appears to me to be a great difference between impurities in milk and adulteration in butter. Whereas the presence of dirt in milk may come under the category of a sin of omission, being the result of negligence or carelessness, reprehensible no doubt, but not wilful, the adulteration of butter by the addition of water, margarine, or other foreign substance, is clearly a deliberate sin of commission, impossible to justify, as it is done wilfully, and for the purpose of making extra profit out of the ignorant purchaser.

MILK.

During the past few months there have been many meetings and conferences of scientific, medical, and other bodies, at which amongst other questions have been discussed the impurities that are alleged to be too frequently present in milk.

Apparently, only the home supplies of milk were taken into consideration, as I have seen no mention made of foreign

supplies; but the general consensus of opinion was that the Model Regulations of the Local Government Board as to Dairies, Cowsheds, and Milkshops, should be more stringently enforced, and that to those already in existence fresh clauses should be added dealing with the sanitary conditions of the farmyard.

At these conferences it was generally recognised that impurities may be taken up by milk at various times; but the "fountain head of milk contamination" was invariably put down to the farms; while dirt collected during transit on the railway, or on the premises of the milk distributor, or at restaurants, or in the dwellings of the poor, did not appear to be seriously considered, the prevailing idea being that, if milk left the farm free from dirt, the chances of its being polluted afterwards were more or less remote.

Writing from the farmer's point of view, it is not necessary for me to go into the question of dirt finding its way into milk after it has been taken over by the consignee; but I must express my opinion that milk over twelve hours old (and very little milk is distributed in our large towns before that time has elapsed), when exposed to the atmosphere of some ill-ventilated and dirty house, or placed as I have seen it, in open tumblers on the counters of restaurants and refreshment bars at railway stations, must certainly collect or attract to itself dirt and other offensive matter.

Returning, however, to the farm as being the original source of the supply, there are four different ways by which dirt may be brought into contact with milk: (1) the cowsheds; (2) the cows; (3) the milker; (4) the dairy utensils.

Cowsheds.—Cows are naturally clean animals. When lying out at grass, or when in loose boxes with plenty of room and clean litter, they will with scarcely an exception lie perfectly clean. If, however, the stalls in the cowsheds are not properly constructed, cows cannot lie clean, and then they appear to get callous and not to mind whether they are dirty or not.

With wrongly constructed stalls the labour of cleaning the cows is considerably increased, and as a matter of fact the men, having none too much time for this, get careless and neglect the cattle altogether, the result being that the cows' thighs become plastered with manure.

The mistake in cowsheds is that too often the mangers are placed at the same height as if for a horse, and the standings are made too wide and too long. Mangers for cows should be on the floor level. The length from the wall or back of the manger to the back of the stall, or standing, should be just sufficient for the cow to stand up or lie down in, her head in both positions being over the manger. The width of the stall

should be enough to let her stand and lie down straight, without being able to turn round and lie across it. The gutters behind the stalls should be eight inches deep, and of sufficient width to allow shovels and brooms to be used freely for cleaning out the manure.

The cows should be fastened by the neck with a chain or strap attached to a ring on a short length of chain, with a swivel, working up and down a bar of iron two feet long, which should be fastened vertically to the side of the stall, about two inches in front of the manger. The chain or strap should be tied to the ring with cord, so that in the event of anything going wrong with the cow, the cord can be cut at once and the animal set free.

I give below the measurements of cow stalls, each to hold two cows. I have found by experience that in stalls of these dimensions the cattle will be comparatively clean. Two sets of figures have been given to suit the larger and smaller breeds of cattle.

	Shorthorn		Jersey	
	ft.	in.	ft.	in.
Total length of stall from outside wall of manger to back of the standing . .	7	3	6	9
Width of stall to take two cows. . .	8	0	7	0
Width of manger from front to back. .	1	10	1	10
Depth of manger from front to back . .	0	9	0	9
Depth of gutter behind cows . . .	0	8	0	8
Width of gutter	2	0	2	0
Height of hay rack from bottom of manger to bottom of hay rack	4	0	4	0
Height of hay rack	2	0	2	0

The floor of the stalls should be level, and both the stalls and the gutter should be well littered with straw.

In such standings cattle should keep clean, while with more room they will be found to get dirty. They soon get accustomed to the comparatively small dimensions of the stall, and the labour saved to the men who look after them is considerable. In my own buildings one set of cow stalls was accidentally made six inches too long. The cattle were very dirty in those stalls until a reduction in the length was made, when they lay perfectly clean again. The great secret in building cow stalls is to make the cows lie down exactly in the same spot where they stand to feed, and this can only be attained by building the mangers on the floor level and of such a height that the cows can rest their heads over the manger when lying down.

Cows.—The work of cleaning cows, if standing in stalls such as described above, will be found to be comparatively light. Before milking, the manure should all be removed from the cowsheds and the hind quarters and udders of the cows brushed over, or, if necessary, washed.

Milkers.—After cleaning the cows the men should wash their hands with soap and warm water. They should then put on their milking aprons, which should be made of a coarse washing material, when they will be ready to commence work. A pail of water and a towel and soap should be brought into the cowshed, and between milking each cow the men should again wash their hands. This may be thought too much to expect. I can only say that my own men have done it for years without making any complaint.

Although the cows and men under such regulations should be clean, yet even with the greatest care it is difficult to prevent particles of dust from finding its way into the milk during the process of milking. To prevent this, I have followed the practice obtaining in the Channel Islands of milking through dairy muslin; but a gauze strainer will probably do equally well. The Channel Islands milking pails are shaped like a jug, with a handle and wide rim, the diameter of the rim being about eight inches. Over this is placed a piece of clean dairy muslin which is wound round the handle to keep it in position. No straw or dust can thus get into the milk, and if any is seen on the muslin during milking it can be removed at once; so that, as far as the eye can see, nothing impure can get into the milk pail at all.

It goes without saying that milk should not be left in the cowsheds but taken at once to the dairy, where it should be again strained through muslin before being passed through the refrigerator, or separator, as the case may be.

Dry milkers are preferable to those who milk with wet hands.

Dairy utensils.—All the churns, pails, &c., in use in a dairy must of course be kept clean; but where milk is sent by rail and the usual pattern of churn is used, dirt may find its way into the milk, as the milk sometimes overflows and runs back again into the churn.

Railway churns should be fitted with tight covers which should also be padlocked. There is, I understand, no objection to this on the part of the Railway Companies, provided the tare is conspicuously stamped on the outside of the churn. It is not my province to recommend any particular make of churn, but I believe there are churns on the market which would fulfil these conditions.

In making these suggestions with a view to ensure that dirt may be kept out of milk I must not be taken as expressing an opinion that the milk usually sent out from dairy farms in England is "diluted with filth" (*Daily Graphic*, August 28, 1906), or that it is responsible for the numerous ailments attributed to it. I know little or nothing of the milk imported from abroad, except from what I saw and heard on two

occasions, when I came into contact with it officially and unofficially. Apparently it is put on the market here with but scant supervision, for on the two occasions mentioned I was not impressed favourably either with its cleanliness or its genuineness.

The fact, however, remains that rightly or wrongly the cry of "dirt in milk" has been taken up, and it therefore behoves farmers and milk purveyors to do all in their power to satisfy the public that, so far as English milk is concerned, it shall be sent out as pure in every sense of the word as it can be; otherwise the public will demand special legislation on the subject, which will mean an increase of rates, without, I fear, a corresponding rise in the price of milk.

Before leaving this question of the purity of milk, I would call attention to the artificial colouring of milk which takes place after it has passed out of the farmer's hands. The richer the milk the deeper the colour, is a maxim so well known that it is hardly necessary to repeat it; and although I believe the colouring of milk is not done with the view of obtaining a higher price (milk being usually sold regardless of the percentage of fat it contains), yet the practice is dirty, and should, in the interests of the consumer and producer, be stopped; or, at any rate, the fact of colouring material being added to the milk should be disclosed to the purchaser.

Butter.

It is comparatively easy to discover dirt in milk, but to ascertain impurities in butter requires the skill and training of an analyst and bacteriologist; and even then it is possible to mix moderate quantities of margarine with butter in such a way that the experienced chemist cannot find a real distinction between the adulterated and the genuine article. It is, therefore, not surprising that the general public cannot tell genuine from "faked" butters, under which term I include blended butters of every description, whether mixtures of pure butters only, or a compound of margarine, foreign fat or water.

Genuine butter I would define as butter churned once from pure cream, to which neither colouring matter nor preservatives have been added, containing 10 to 12 per cent. of water, and from 83 to 87 per cent. of butter fat. The selling price of butter is generally a fair test of the quality; but, in order to understand this, certain figures must be gone into, and the description under which the butters are sold must also be considered. It is obvious that if one can get at the cost of making genuine butter in England, the selling price can be approximately estimated, an allowance for a fair profit to the middleman being easily calculated.

The average wholesale prices of milk in England and Ireland may be put at 8*d.* and 4*d.* per gallon respectively, very little milk changing hands at lower figures. They may therefore be taken as representing the average amount paid by factories to farmers for their milk.

The amount of milk in pounds required to make 1 lb. of genuine butter (known as the butter ratio) differs according to the quality of the milk, some breeds of cattle yielding milk considerably richer in butter fat than others.

The following Table gives the butter ratio figures of the various dairy breeds in England, the number of pounds of milk being also shown in gallons:—

TABLE I.

Breed	Butter ratio	Gallons of milk
	lb.	
Shorthorn.	28	say $2\frac{3}{4}$
Red Polled	30	,, 3
South Devon	25	,, $2\frac{1}{2}$
Ayrshire	26	,, $2\frac{3}{5}$
Dexter	25	,, $2\frac{1}{2}$
Kerry	25	,, $2\frac{1}{2}$
Guernsey	20	,, 2
Jersey	18	,, $1\frac{3}{4}$

Multiplying the number of gallons by 8*d.* and 4*d.* respectively, the selling price of milk per gallon in England and Ireland, the cost of 1 lb. of butter, if made from the milks mentioned above, will be as follows:—

TABLE II.

Breed	Cost of butter per lb. if milk at 8*d.* per gallon	Cost of butter per lb. if milk at 4*d.* per gallon
	s. *d.*	*s.* *d.*
Shorthorn.	1 10	0 11
Red Polled	2 0	1 0
South Devon	1 8	0 10
Ayrshire	say 1 8	0 10
Dexter	1 8	0 10
Kerry	1 8	0 10
Guernsey	1 4	0 8
Jersey	1 2	0 7

With very few exceptions the milk from Jersey and Guernsey cows in England is used in private dairies, and does not come into the open market at all; so that it may be left out of the calculations. The remaining figures show pretty clearly that genuine butters cannot be made in England to sell at a

profit under the prices given above ; and certainly no factory in England can afford to pay 8*d.* per gallon for the milk and then sell butter at less than these prices unless "faking" is resorted to.

In Ireland the price paid for milk is low, and genuine butters can be sold at low prices. There are two grades of Irish butter known on the market, viz., "Creameries" and "Factories," the former being genuine butter made at one churning, the latter, genuine butters made in small lots, collected together and blended at the factories. Both are pure, but the one is naturally better than the other.

The butter ratio of the Danish cattle may be put down at 27 lb. or $2\frac{3}{4}$ gallons, the Brittany at 25 lb. or $2\frac{1}{2}$ gallons, the Dutch at 30 lb. or 3 gallons. These butters are all made and blended in their country of origin, so they are not in great demand here for blending purposes. The best parcels from Denmark and Brittany are fairly well made ; they cannot compare in any way with the best English butter made in private dairies, yet they command a good price and must leave a profit to the producers.

In this connection I would mention that the Danes have imported a considerable number of Jersey cattle during the past few years, with the double object of improving the quality of the butter, and making it at less cost.

It is not necessary to go into the butter ratios of the cattle in New Zealand, Australia, and Canada, although they are probably much the same as the cattle here (the breeds being the same as ours) ; because the supply of milk being larger than the demand, the cost of the milk and butter does not enter into the question in the same degree as here. It is not therefore surprising to learn that the best New Zealand, Australian, and Canadian butters, when sold here at prices ranging from 106*s.* to 116*s.* per cwt., leave a satisfactory profit to the makers.

Butters also come into this country from Italy and Siberia, but they, with the Dutch butters, are not at all comparable in quality to the Danish and Brittany, as is shown by the low prices quoted for them in the market reports.

Of all the butters that come into England, the Irish, New Zealand, Australian, and Canadian are the best. They are genuine butters (the Colonial not being coloured), not faked or blended in any way, except as mentioned above, but are the produce of cows fed on natural grasses. The Colonial butters are also exceptionally dry, the amount of moisture ranging from 10 to 13 per cent. These butters should all be sold at reasonable prices here ; but unfortunately the Colonial butters are bought up largely by the blending factories both

in Holland and at home, as their low percentage of water and their excellent quality make them suitable subjects for the blending process.

The word "blending" covers a multitude of sins. It may mean mixing two butters together, although this is only done when one of them is probably of very poor quality; or it may mean the addition of some foreign substance, or the overloading of the pure butter with water. In all cases the object of the blending is the same, viz., to put profit into the pocket of the blender.

A great deal of sentimental nonsense is talked on the subject of the so-called milk-blended butter. It is said that the poor get a more palatable article of food, that it is softer and spreads better, &c.; but in my opinion the poor would do much better if they could get the genuine Colonial butter first hand, instead of an overworked second edition of the same, overloaded with water, or mixed with some other foreign substance.

A blending factory must make a considerable profit on every pound of Colonial butter it handles, while the purchaser of milk-blended butter is equally defrauded on every pound he purchases, since he probably only gets from 12 oz. to 13 oz. of butter fat in every pound he buys.

The Siberian butters are also bought for blending and mixing, and as they are quoted at a lower price, the profit on them is probably larger.

It is almost impossible to say of what Dutch butters consist, since genuine butter, made from the milk of Dutch cows, could not be sold here at a profit. Large quantities of our Colonial butters are sent from here to Holland, mixed up with other substances, and returned to this country for sale. Some may only contain an excess of water, but where so much "faking" is done, it is hard to believe that any of the low-priced butters exported from Holland here are pure.

The question of genuine margarine does not come within the province of this article; but if it is manufactured in this country and is sold under its proper name, no harm can be done to any one, as the purchaser knows what he is buying, and the English margarine factories are now under Government inspection.

Where, however, "lardine" and other similar substances are mixed with butter in such small proportions as to baffle the analyst, then no punishment can be too severe. These illegitimate blending factories are not under Government control, as they are supposed to be only butter factories, and it is therefore difficult to find out anything about the compound they use.

Recollecting the disclosures at Chicago, and knowing that beef fat is the foundation of the adulterants used for faking butter, one cannot but feel that the sooner all dairy factories are placed under the same inspection as the margarine factories, the better will it be for the public.

Perhaps as the result of the Report of the Select Committee on the Butter Trade, a Bill dealing with the whole subject will be presented to Parliament. If so, it is to be hoped that it will receive the support of all parties, since adulteration of food cannot be considered, in any sense of the word, a political question.

To any one interested in this subject I would commend the Reports of the Local Government Board and the Board of Agriculture and Fisheries for 1906, as also the Report of the Select Committee mentioned above. A perusal of these will, I think, satisfy the reader that I have not in any way overstated the "faking" that takes place in butter factories, and the general demoralisation of that particular trade.

With the good market for milk that there is in England, butter-making cannot be profitable unless a price corresponding to the value of the milk is obtained for the butter, but that is no reason why the good and genuine produce from our own Colonies should be intercepted before reaching the public, or why a trade which flourishes on these shady practices should be allowed full latitude to carry on its doubtful business.

ERNEST MATHEWS.

Little Shardeloes,
Amersham.

THE DERBY SHOW, 1906.

WHEN it was finally decided to discontinue the Annual Show at Park Royal and return to the original plan of Country Meetings, the Society was at once favoured with an invitation from the Corporation of Derby to hold the Show of 1906 in their town. A deputation from the borough and county of Derby was received by the Council on November 1, 1905, when it was unanimously decided to accept the invitation. In order that the Society might not be hampered with the possibility of a loss on the first Show held on returning to the country, a Member of the Council generously guaranteed any loss which might be incurred.

Derby now shares with Newcastle, York, and Carlisle the distinction of having thrice received the Society. The first visit to Derby took place in 1843, under the presidency of the fourth Earl of Hardwicke. The Country Meeting was again held at Derby in 1881, after an interval of thirty-eight years; and a third Exhibition has now been held there a quarter of a century later. Subjoined are some details as to the three Derby Meetings of 1843, 1881, and 1906 :—

Year	Place of Meeting	President of the year	Articles entered	Entries of live stock	Number of persons paying for admission	(+ = *Profit* — = Loss)
						£
1843	Derby . .	Earl of Hardwicke . .	508	730	—	— 3,164
1881	Derby . .	Mr. William Wells . .	5,960	1,229	127,996	+ *4,528*
1906	Derby . .	Mr. F. S. W. Cornwallis .	4,772	2,319	119,143	+ *2,028*

The Derbyshire Agricultural and Horticultural Society co-operated heartily and suspended its own Show in favour of that of the "Royal." In return the members of the Derbyshire Society received the same privileges in connection with the Show as members of the Royal Agricultural Society.

A popular feature at Derby was the provision of classes for live stock and produce open only to *bonâ fide* tenant farmer members of the Derbyshire Agricultural Society residing within the local area. The animals in these classes were exhibited on one day only, viz., Friday, June 29. Butter-making competitions were held in the Dairy on Thursday, June 28, and Saturday, June 30, for residents in Derbyshire who had been pupils of the Travelling Dairy School in Nottinghamshire or Derbyshire, or of the Midland Agricultural and Dairy College. The Horticultural Exhibition of the County Society, which was held in a large tent, proved most attractive.

THE SHOWYARD.

As in 1881, the Show was held in Osmaston Park. Since that year, however, this property had been acquired by the

Midland Railway Company, who generously placed a site in the park at the disposal of the local authority for the purposes of the Show. The Company also constructed sidings adjoining the Showyard which enabled them to deal with the implements and exhibits of live stock in an expeditious manner. The goods stations of the London and North Western and the Great Northern Railway Companies were within three-quarters of a mile of the Showyard.

The distance of the Showyard from the centre of the town of Derby was about one mile, and the Corporation, with the view of improving the facilities for conveying the public to and from the Show, doubled the then existing single line of electric tramway along the London Road.

A stream which flowed through the Showyard was transformed into an ornamental rock garden, with cascades, rock plants, and other picturesque features. Summer houses, pergolas, fences, seats, &c., were placed in close proximity to and on the bridge over the stream. The effect of these combined efforts was most striking, and at the King's desire the royal carriage was stopped to enable His Majesty to inspect the scene.

A pavilion for the use of the President and officers of the Board of Agriculture and Fisheries occupied a prominent position. Space was provided for the erection of a pavilion for the Farmers' Club—a new privilege which was greatly appreciated by the members of the Club.

Entries.

The following Table shows the entries of live stock, and the quantity of space allotted for stands in the implement section of the Show, compared with the previous seven Shows of the Society and the Derby Show of 1881 :—

Live Stock, Poultry, and Produce.

	Derby, 1906	Park Royal, 1905	Park Royal, 1904	Park Royal, 1903	Carlisle, 1902	Cardiff, 1901	York, 1900	Maidstone, 1899	Derby 1881
Horses . .	[1] 563	[2] 372	[2] 365	422	521	355	696	424	256
Cattle . .	[1] 926	898	867	944	667	553	687	683	392
Sheep . .	564	591	525	520	545	519	614	631	414
Pigs . . .	266	252	227	222	178	148	—	147	167
Total . .	2,319	2,113	1,984	2,108	1,911	1,575	1,997	1,885	1,229
Poultry . .	811	871	603	763	653	701	629	669	—
Produce . .	525	493	544	609	461	521	528	625	—

[1] Exclusive of Double Entries.
[2] Exclusive of Draught Horses and the Harness Classes.

Shedding in Implement Yard (in feet).

Description of Shedding	Derby, 1906	Park Royal, 1905	Park Royal, 1904	Park Royal, 1903	Carlisle, 1902	Cardiff, 1901	York, 1900	Maidstone, 1899	Derby, 1881
	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet	Feet
Ordinary .	7,818	6,590	7,630	9,360	6,693	7,245	9,454	7,455	9,138
Machinery .	2,520	1,750	2,060	2,670	2,079	2,305	2,547	2,192	2,102
Special . . (Seeds, Models, &c.)	2,692	1,629	2,032	2,555	2,321	2,101	2,771	2,553	1,511
Total . . [Exclusive of open ground space]	13,030	9,969	11,722	14,585	11,093	11,651	14,772	12,200	12,751
No. of Stands.	424	289	350	456	340	358	412	395	377

The Table on page 130 gives a comparative statement of the entries at the two Derby Meetings of 1881 and 1906.

The Show.

As in 1905, the Show lasted four days, opening on Wednesday, June 27, and closing on the following Saturday, June 30. On the first day, which was occupied chiefly with the judging of live stock, rain fell for some hours in the morning, but happily the weather cleared in the afternoon.

On the second day (June 28), the King honoured the Show with a visit. His Majesty, travelling by special train from London, arrived at noon at the Nottingham Road Station, where the Duke of Devonshire (Lord High Steward of the Borough) presented the Mayor of Derby (Mr. Alderman E. T. Ann) and a number of other representatives of the Borough and County. Accompanied by the Duke of Devonshire, Lord Colebrook, and Major Holford, His Majesty then drove in an open carriage from the station to the Market Place, where an Address from the Corporation, contained in a handsome casket of Royal Crown Derby China, was presented by the Mayor.

His Majesty's reply was as follows :—

"As you are aware, agriculture, on which so many of my subjects are dependent for a livelihood, has ever been a subject in which I have taken the warmest personal interest. I feel that exhibitions of stock and machinery, such as the annual show of the Royal Agricultural Society now being held in this borough, are of the greatest utility to the country, serving to stimulate agricultural progress and to impart information of the greatest service to those engaged in the industry."

The Royal party next stopped at the junction of the London and Osmaston roads, where the King unveiled a statue of Queen Victoria which had been presented to the town by Sir Alfred Haslam. His Majesty reached the Showyard at half-past twelve, and was received at the entrance by

COMPARATIVE STATEMENT OF ENTRIES, ETC., AT THE TWO MEETINGS HELD AT DERBY IN 1881 AND 1906.

	1881 (July 13-17)	1906 (June 27-30)
IMPLEMENTS—Stands	377	424

HORSES AND CATTLE	1881		1906	
	Classes	Entries	Classes	Entries
HORSES:—				
Prizes	—	*£1,210*	—	*£2,070*
Hunters	6	50	8	64
Cleveland Bays	—	—	3	21
Coach Horses	—	—	3	12
Hackneys	5	21	12	76
Ponies	3	15	5	21
Mountain, &c., Ponies			2	5
Shetland Ponies	—	—	2	9
Polo Ponies	—	—	5	35
Riding Classes	—	—	8	60
Harness Horses	—	—	11	89
Shire	8	93	10	142
Clydesdale	6	34	6	28
Suffolk	6	27	6	29
Agricultural Horses	4	16	3	15
Asses	—	—	2	5
Total for HORSES.	38	256	86	611
CATTLE:—				
Prizes	—	*£1,475*	—	*£2,323*
Shorthorn	8	134	11	327
Lincolnshire Red Shorthorn	—	—	8	36
Hereford	8	33	6	59
Devon	8	23	6	27
South Devon	—	—	3	11
Sussex	5	28	6	39
Longhorn	7	45	5	21
Welsh	—	—	4	16
Red Polled	5	22	7	55
Aberdeen Angus	—	—	6	76
Galloway	—	—	4	24
Highland	—	—	2	2
Ayrshire	—	—	3	9
Jersey	6	89	7	142
Guernsey	3	14	7	53
Kerry	—	—	4	23
Dexter	—	—	4	51
Dairy cattle	4	4	—	—
Special Milk Yield and Butter Test.	—	—	2	68
Total for CATTLE.	54	392	95	1,039

SHEEP, PIGS, POULTRY, PRODUCE	1881		1906	
	Classes	Entries	Classes	Entries
SHEEP:—				
Prizes	—	*£785*	—	*£1,400*
Oxford Down	3	30	4	30
Shropshire	4	152	7	104
Southdown	3	72	6	71
Hampshire Down[1]	3	25	5	54
Suffolk	—	—	6	34
Dorset Horn	—	—	4	22
Lincoln	4	39	6	54
Leicester	3	40	4	27
Cotswold	3	31	4	15
Border Leicester	—	—	4	13
Kent or Romney Marsh[2]	4	25	5	64
Wensleydale	—	—	4	11
DevonLongWoolled	—	—	3	10
South Devon	—	—	2	6
Dartmoor	—	—	2	4
Exmoor	—	—	2	4
Cheviot	—	—	2	6
Black-faced Mountain	—	—	2	12
Lonk	—	—	2	5
Herdwick	—	—	2	5
Welsh Mountain	—	—	2	16
Ryeland	—	—	3	13
Total for SHEEP	27	414	81	580
PIGS:—				
Prizes	—	*£240*	—	*£479*
Large White	4	47	5	66
Middle White	—	—	5	33
Small White	4	38	—	—
Berkshire	4	59	5	69
Tamworth	—	—	5	36
Large Black	—	—	4	62
Small Black	4	23	—	—
Total for PIGS	16	167	24	266
TOTAL FOR STOCK	135	1,229	286	2,496
POULTRY:—				
Prizes	—	—	—	£207
Entries	—	—	107	811
PRODUCE:—				
Prizes	—	*£115*	—	*£233*
Entries	7	62	48	525

Grand Totals for LIVE STOCK, POULTRY, and PRODUCE.	**1881**	**142 Classes**	**1291 Entries**	**£3,664[3] Prizes**
	1906	*441* ,,	*3,832* ,,	*£6,888*[4] ,,

[1] Including other Short Wools in 1881. [2] Including Devon and other Long Woolled breeds in 1881.
[3] Including £315 for Farm Prizes. [4] Including £176 for Competitions.
N.B.—The 1906 figures include Entries made in more than one class.

Sir Gilbert Greenall (Honorary Director), and at the Royal Pavilion in the centre of the Showyard by Mr. Cornwallis (President), and other Members of the Council of the Society.

An Address from the Derbyshire Agricultural Society was next presented by the Duke of Devonshire as President of that body. The Address stated that the great interest and warm sympathy His Majesty had always shown with regard to agriculture had done much to stimulate good farming, and to encourage the raising of stock of the highest quality.

His Majesty replied as follows :—

"I have long appreciated the difficulties with which farmers have to contend in order to carry on their industry. The cultivation of the land is a factor of the highest importance to the prosperity of the country, and much credit is due to agricultural societies for their strenuous efforts to promote the welfare of the cause they have at heart by encouraging new processes of cultivation and by disseminating information of utility to farmers. I have watched with pleasure during many years the improvements which have been introduced in the methods of raising stock. I cannot peruse without a feeling of pride the sale lists in which I see so many names of purchasers coming to this country from all parts of the world, and I feel confident that the perseverance and skill of our breeders will enable us to produce as good stock in the future as in the past."

The King next made an inspection of Army veterans, to the number of about 150, belonging to the Nottinghamshire Crimean and Indian Mutiny Veterans' Society and the Derbyshire Imperial Veterans' Association, who were drawn up in front of the Royal Pavilion.

His Majesty, having viewed the Implement Department, returned to the Royal Pavilion, where he honoured the President and Council of the Society with his presence at luncheon. Those also present included H.R.H. Prince Christian, K.G., and official representatives of the County and Borough of Derby.

After luncheon it rained so heavily that the King had to complete his tour of inspection in a closed carriage. His Majesty left the Showyard at twenty minutes past three, reaching the Midland station ten minutes later, whence he returned to London.

Although rain was falling heavily during the greater part of the day of His Majesty's visit, the attendance of the public at the Show was remarkable, the number of persons paying for admission (half a crown) being 25,666.

On Thursday, the General Meeting of Governors and Members was held in the large Tent, the Chair being taken by the President (Mr. Cornwallis). Votes of thanks to the Mayor and Corporation and the Derby Local Committee were carried by a largely attended meeting, and in thanking the Chairman for his services that day, the opportunity was taken to refer to the splendid manner in which the President had carried out

the arduous duties of the office during a very important stage of the Society's existence. Mr. Cornwallis, after thanking the meeting for their kind vote, appealed to the Members to assist in firmly establishing the Society by bringing about a larger membership. With their help he felt sure that the Society would receive the support he believed it so richly deserved.

On Friday, the Local Classes were exhibited in the Showyard for that day only, and the judging of the horses and cattle commenced at 9 a.m. On Saturday, a Band Contest, arranged by the Local Committee, was held in the centre of the Showyard, commencing at 2 p.m.; and later a Military Tournament, also arranged by the Local Committee, was held in the large Horse Ring.

During the week, musical selections were performed by the Band of the Coldstream Guards, under the direction of Lieutenant J. Mackenzie Rogan, Hon. R.A.M., and by the Band of the Derbyshire Yeomanry, conducted by Mr. Sydney T. Sadler.

In great contrast to the exceptionally fine and hot weather experienced in 1881, the Derby Show of 1906 was marked by a succession of wet days. But despite these unfavourable conditions the large attendance of visitors was remarkable, as compared with the returns of the Society's recent Shows.

The statements on page 133 give (1) the number of visitors admitted by payment at different times of each day of the 1906 Show, and (2) the total daily admissions of the last six Shows and the Derby Meeting of 1881.

Prize Sheet and Regulations.

The Council did not feel justified in providing more than 4,000*l.* for the prize sheet, but it was hoped that this sum would be supplemented by the various Breed Societies, in order that every established breed of live stock might, as far as possible, have classes and prizes allocated to it. The Council's hopes in this direction were fully realised, as the prizes offered amounted to 6,888*l.*, towards which 2,090*l.* were contributed by the Breed Societies, and 797*l.* by the Derby Local Committee.

The following Breed Societies contributed Champion and other prizes :—

Horses.—Hunters' Improvement, Polo and Riding Pony, Cleveland Bay Horse, Yorkshire Coach Horse, Hackney Horse, Shetland Pony Stud Book, Shire Horse, Clydesdale Horse, and Suffolk Horse Societies.

Cattle.—Shorthorn Society, Lincolnshire Red Short-horn Association, Hereford Herd Book, Devon Cattle Breeders', Sussex Herd Book, Welsh Black Cattle, Red Polled, Polled Cattle Societies, English Aberdeen Angus Cattle Association, Galloway Cattle, English Guernsey Cattle, Longhorn Cattle, English Kerry and Dexter Cattle, English Jersey Cattle Societies, and Dairy Shorthorn (Coates's Herd Book) Association.

Sheep.—Oxford Down Sheep Breeders', Shropshire Sheep Breeders' Associations, Southdown Sheep Society, Hampshire Down Sheep Breeders' Association, Suffolk Sheep Society, Lincoln Long Wool Sheep Breeders' Association, Cotswold Sheep Society, Kent or Romney Marsh, Dorset Horn, Devon Long Woolled, Black-Faced, Lonk Sheep Breeders' Associations, and Ryeland Flock Book Society.

Pigs.—National Pig Breeders' Association, British Berkshire and Large Black Pig Societies.

Poultry—Sussex Poultry Club.

(1) *Admissions by Payment at Derby*, 1906.

Day of Show	11 a.m.	1 p.m.	3 p.m.	5 p.m.	Day's total
Wednesday (5*s.*) . . .	1,019	2,054	2,589	2,740	2,752
Thursday (2*s.* 6*d.*) . . .	7,367	18,041	23,574	25,487	25,666
Friday (1*s.*)	13,874	26,773	39,412	44,263	44,670
Saturday (1*s.*)	11,472	28,986	41,946	45,735	46,055
Total	—	—	—	—	119,143

(2) *Total daily admissions for last six Shows and Derby Meeting of* 1881.

Prices of Admission	Derby, 1906	Park Royal, 1905	Park Royal, 1904	Park Royal, 1903	Carlisle, 1902	Cardiff, 1901	Derby, 1881
Implement Yard only (2*s.* 6*d.*) .	—	—	—	—	2,372	—	366
Five Shillings .	2,752	—	2,011	2,685	2,321	3,155	3,256
Half-crown . .	25,666	2,770	9,375	12,057	7,550	23,745	12,314
Half-crown . .	—	7,684	10,912	11,403	15,398	25,063	18,130
One Shilling. .	44,670	7,754	14,175	20,569	46,242	69,133	53,291
One Shilling. .	46,055	5,770	16,457	18,299	19,304	46,327	40,639
Totals .	119,143[1]	23,978[2]	52,930[3]	65,013	93.187	167,423	127,996

[1] Derby, 1906—Only one Half-crown day.

[2] Park Royal, 1905—No Five Shilling day ; third day, price of admission (2*s.* 6*d.*) reduced to 1*s.* after 3 p.m.

[3] Park Royal, 1904—Second and third days, price of admission (2*s.* 6*d.*) reduced to 1*s.* after 4 p.m.

Auction Sales in the Showyard.

One of the arguments in favour of a permanent Showyard in London was that it provided such an excellent market for stock, and that if the Society returned to the migratory system of Shows in the Provinces, foreign and colonial buyers would not attend in such large numbers. This, however, has not proved to be the case, as the auction sales held in the Derby Showyard realised a total sum of 12,776*l*, or 4,590*l*. more than in 1905 at Park Royal. The figures for the four Shows which

have been held since these auctions were instituted in 1903 are given below :—

	1903			1904			1905			1906		
	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
Horses . .	564	18	0	724	10	0	327	12	0	123	18	0
Cattle. . .	2,377	14	6	3,517	10	0	6,117	6	0	10,034	6	6
Sheep. . .	48	6	0	421	1	0	1,316	13	6	2,045	18	6
Pigs . . .	281	13	6	412	18	3	424	9	3	572	5	0
Total .	3,272	12	0	5,075	19	3	8,186	0	9	12,776	8	0

The animals were generally started at satisfactory prices. The older and two-year-old bulls were not so much in demand unless they were sires of repute ; and, when so, English breeders competed against the foreign buyers. There was better competition for the yearlings, some of the prices paid being 160 guineas, 240 guineas, 300 guineas, and the highest 610 guineas. The competition for the females was quite equal to that of the bulls, forty-two being sold out of the fifty-four offered, whilst seventy bulls were disposed of out of the ninety-nine offered. Most of the cows and three-year-old heifers were bought by English breeders, whilst the majority of the younger animals went to South America. The average for the females was just 10*l.* below that of the bulls. The competition was well sustained to the end, and several Continental buyers were outbidden by South Americans. The feature of the sale was the strong support of the foreign buyers, who purchased sixty head out of 112. The sheep auction sale was also attended with much success, the number of animals disposed of and the amount realised being considerably in advance of the previous year's aggregate, which in turn was the best of the three sales at Park Royal. The sales of pigs were also an improvement on the previous year's totals, and the horse sales alone showed no advance.

Horses.

The following detailed description of the various exhibits is based upon the official reports of the Judges. It is satisfactory to note that there was a considerable increase of horses, the number of entries received (563) being the largest recorded since the York Meeting of 1900. The best-filled classes were those for Shires with 142 entries, the Hackneys numbering 76, and the Hunters 64.

Hunters.—The entries in this section were above the average of the last four years. The Judges reported that the brood mares (Class 1) were fair, the winner being a good

type of mare. The foals, however, were decidedly poor. The yearling fillies were a good class, and the prize winners were all of capital merit. The exhibits in the two-year-old class were mostly well grown, with quality. The three-year-old filly class was not a good one. The winner in Class 8 (yearling colts or geldings) is a useful colt. The two-year-old gelding prize winners were useful. The first prize three-year-old gelding was an exceptionally good horse. The breeding and young horses were, on the whole, very good. The Hunters shown under saddle were decidedly above the average, and the winners were all horses of considerable merit and good quality.

Polo and Riding Ponies.—The animals shown under saddle were few in number and not exceptional in merit. The exhibits in the breeding and young classes were all very good.

Cleveland Bays.—The Judge reported that Class 14 (stallions foaled in 1903 or 1904) was one of the best he had seen. The first prize colt had plenty of bone and good all round action. The second was a similar horse but was "rather short coupled." Class 15 (brood mares with foals) was remarkably good. The first prize filly in Class 16 had fine action and plenty of quality.

Coach Horses.—The stallion and filly classes were better filled than they have been for some years past, and some of the animals were of considerable merit. In Class 18 (mares with foals at foot) there were only two entries. The fillies were a good class of average quality.

Hackneys.—The Judges of these classes presented the following report on the exhibits which came before them :—

The breeding section of Hackneys was well above the average in numbers, and the quality throughout was excellent, most of the best animals seen out this year being entered. Yearling colts and the newly formed classes for geldings were the only weak entries.

Three-year-old stallions had four first-class hackneys at top. The winner, *Brigham Radiant*, a very typically fine-actioned bay by "Rosador," was afterwards placed reserve for Champion honours. Sir Walter Gilbey's *Dashing Lad*, by "Royal Danegelt," was a good second. Mr. Haley took third with a big free-moving chestnut by "Rosador." Two-year-olds formed a capital class, and contained the Champion stallion, *Copmanthorpe Performer*, sired by "Garton Duke of Connaught," a dark chestnut, short-legged, brilliant-actioned colt which was Junior Champion in London, and the best young horse seen out this season. Mr. Evans was second with *Gartonius*, a home-bred one, and, like the winner, sired by "Garton Duke of Connaught." He is well made, with good bone and excellent action, and is a very improving sort.

Only three yearling stallions were entered, all of which were present, Mr. Hall winning with a son of "St. Thomas," which has fair action and looks. The larger brood mare class brought out several fine matrons, at the head off which stood *Rosadora*, a well-known winner and London Champion. She made a great show and well won the highest honours later on, when she was adjudged Female Champion. Sir Walter Gilbey's *Mitre* is also an excellent stamp of brood mare, built somewhat on heavier lines than the winner, and also possessed of fine action ; whilst the third, Mr. de Mancha's *Bashful Kate*

is a beautiful quality mare, but lighter in build than those placed above her. *Maudora*, by "Rosador," headed the under 15-2 class of brood mares. Shown in excellent form with fine action, she was an outstanding winner, being followed by Mr. Evans' *B.B. Iris*, another good all round mare, with excellent shoulders and limbs. In a large class of foals the winner owned "Copper King" as sire, a well grown, well balanced dark chestnut with good limbs and action. Three-year-old fillies formed a good class, Mr. Buttle winning with *Boquhan Sunrise*, a beautiful dark chestnut by "Rosador." She made an excellent show, and later on was Reserve Champion. Mr. Evans was second with his brilliant actioned bay, *Terrington Ruth*, bred by Sir Gilbert Greenall. Two-year-old fillies were an average class, the winner, Mr. Cooke's *Lilladora*, making a fine show. Yearling fillies were easily headed by Sir Walter Gilbey's *Lively Beeswing*, which made quite a sensational show, added to which she is very typical and well grown. Beyond the winners, the geldings in hand were moderate.

Ponies.—These were very strongly represented, and in Class 32 (three-year-olds and upwards) several brilliant ponies were entered, Mr. Ravenhill Stock winning with *Son o' Horace*, a beautiful bay of excellent shape and action, followed by Mr. Whitworth's *Jack Spratt* and Mr. Price's *Lyndhurst Phosphorus*, both fine movers. Only two pony brood mares came out, both, however, good ones. Mr. Tatem's *Mel-Valley Princess*, so well-known in harness classes, was first, with a good foal by "Ruby," and Mr. Price's good-looking *Gold Fleece*, by "Sir Horace," was second. Mr. Price won in the small class with *Berry Hill Smart*, a fine moving pony, bred by Mr. Hollins and sired by "Prospector."

Harness Horses.—The innovation of permitting horses in harness to be shown in more than one class, where eligible, was evidently appreciated, and probably helped to bring together the best classes that have been seen this season at any show. In a good class of ponies under 14 hands, Mr. T. B. Sykes won with a quality bay gelding, *Fylde Forester*, which made a good show, followed by *Burlington Sir Horace*, also a fine mover. In the 15 hands class a new comer was seen out, Dr. Dalston-Ewbanke's roan mare, *Affection*, the heavy going apparently suiting her, as she made a great show, with the best of manners. Here Mr. Sykes stood second with *Fylde Zarena*, whose action is good all round, though she is somewhat plain. In the over 15 hands class, Mr. McKibbin won somewhat easily with *Langton Gelding*, followed by Mr. Burnell-Tubbs' Richmond winner, *Gongelt*, with Mrs. Hartley Batt's *Prince Edward*, a quality chestnut, third. The foregoing classes were for novices which had not won a prize of over 6*l.* prior to the closing of the entries.

In a small class of ponies under 13 hands, Mr. Waud scored a meritorious win with *Ferniehurst Fortuna*, a sweet pony mare by "Sir Horace." There were three excellent ponies under 14 hands, Miss Clarke's *Highbrook Belle* making light of the heavy going, and moving in brilliant form. So

also did the second, *Tissington Kit Cat*, a brown by "Sir Horace," of true Hackney type. *Model Queen* was third.

In the class for horses between 14 and 15 hands, Mr. J. S. Sykes won with *Fylde Sabrinetta*, by "Garton Duke of Connaught," this mare making a brilliant show with the best of manners. Champion honours were eventually awarded to her. Mrs. Hartley Batt's *Hopwood Spark*, by "Sir Horace," a fine moving bay, was second, followed by *Lady Defiant*, another good mover. This was an excellent class. In the class not exceeding 15-2 hands, Mr. Tennant's well-known *Authority*, by "Ganymede," won well with his brilliant action. Mr. Makeague's *Luminator* was second. In the over 15-2 hands class, Mr. Gerard Jurgens, from Holland, won with the brown gelding, *Radiant*. This good-looking son of "Mathias" was evidently enjoying the mud, going both fast and high all round. *Silver Ness*, a well-known winner, was second—a typical Hackney mare by "Canny Man." Mr. Le Marchant's big chestnut gelding, *The Only Way*, was third.

The under 15-2 hands pairs produced as well-matched and fine-actioned horses as could be seen anywhere. Mrs. Hartley Batt's *Hopwood Spark* and *Hopwood Horace*, own brothers by "Sir Horace," had perfect manners and brilliant action. A valuable pair, *Authority* and *Astonishment*, were next, with Mr. Makeague's bays in third position, and Mr. Paul Hoffman's *King of Fashion* and *Prince Dashaway*, Reserve. In the larger classes for pairs, Mr. Gerard Jurgens' well-matched *Radiant* and *Glenburn Lass* made a grand show, and well deserved the first prize. Mr. Kerr's pair were second, and Miss Ella Ross's well-known blacks were third. In tandems, Mrs. Hartley Batt again won somewhat easily with *Hopwood Spark* and *Hopwood Horace*, Miss Ella Ross being second with her perfectly trained blacks.

Shetland Ponies.—These animals were typical of the breed, and the winners had splendid action.

Mountain and Moorland Ponies.—The Judge states that the stallions were good specimens of what is required. The winner was a particularly powerful straight goer. The two mares were nice, smart, and handsome.

Shires.—Nearly all the classes for Shires at Derby were exceptionally good and much better than they have been the last few years at the "Royal." In Class 60 (three-year-old stallions) the winner was a true level animal, and he was followed by some very weighty horses. The two-year-old stallions (Class 61) were larger in number and were a very good lot, there being several animals that looked like doing good to the breed in future. The yearling colts (Class 62) were a very useful lot. The class for mares with foals at foot

brought out a number of good animals of fairly equal merit. Mares (without foals) were very good indeed, and the same may be said of the three-year-old fillies, there being some grand animals in this class. Class 68 (fillies, foaled in 1904) was a large one, the winner having plenty of size and quality ; the class throughout was of great merit. The yearling filly class was also very large, there being many animals of uniform merit. In the local classes there were many good animals, especially the fillies foaled in 1904-5.

Clydesdales.—In the class for brood mares with foals at foot, only three came forward. The winning mare was an exceptionally good one, with size, symmetry, and quality, and she was a good mover. This mare was afterwards awarded the Female Championship. The three-year-old filly, which was the only one of that age shown, was a good specimen of the breed and a good size, with fine wearing feet and legs. The two-year-old fillies were all of good promise, the first prize filly being specially well brought out, with the best of bone and good feet.

In the class for three-year-old stallions, the animals were of entirely different types—the first being of the clean-boned kind with size, and likely to make a wearing stallion ; the other being more of the old-fashioned short-legged sort. Of the two-year-old stallions, the first prize winner, a black colt of good size and substance, was also awarded the Male Championship. The first in the yearling stallion class was a colt of fine quality, well set on his pasterns ; he looked like growing into a good horse. The second was a big-sized colt, but lacked the quality of the first. On the whole the quality of the exhibits was fairly good.

Suffolks.—The Judges expressed their regret that these classes were not better filled, Class 77 (stallions, foaled in 1904) only really representing the breed in point of numbers. The first prize horse in Class 76 was good in quality and substance, but might perhaps have stood over more ground. He also took the Championship. In Class 77 the first prize winner was full of quality, but slightly lacking in bone below the knee. The second prize horse, though plain on the top, was a promising colt. The exhibits in Class 79 were all beautiful mares, and typified the best points of the breed. The first prize animal in Class 80 was a charming filly, close to the ground, with substance and quality combined.

Agricultural Horses.—The Judges reported that in the four-year-old class the winner was a massive big sound horse. In the three-year-old class, in which there were seven entries, the first four possessed all the characteristics which go to make a valuable horse for heavy work. Only two horses were shown

in the two-year-old class, but the winner was of exceptional merit, having size and substance, with good feet and legs.

Asses.

The two new classes for asses were the means of bringing together some very fine specimens of jacks and jinnies, probably some of the best in Europe. The entries might, however, with advantage have been more numerous, only five being received. Donkey breeding has been neglected in England, while neighbouring countries such as France, Italy, and Spain have devoted much thought to it; and, in view of the large demand for good jacks from the warmer countries, including parts of our own empire, such as India, South Africa, and Australia, it is a subject that is well worth our attention and encouragement, as in the countries mentioned the best jacks command prices of several hundred pounds sterling.

In the stallion class, the first prize jack was a black Spanish three-year-old of great bone and substance, very true in his movements, and showing every promise of being a very exceptional animal at five years old. The second prize animal, a five-year-old white Spanish jack, well proportioned and shown in excellent condition, was certainly one of the finest white jacks living, but he lacked the height and exceptional size of the first prize animal.

The first prize mare or jinny was also a black Spanish, true in her lines and extraordinarily high. The second prize almost equalled her in height, had more bone and substance, but was not so level over the back and quarters. It was a pity there were no entries of cross-bred Spanish and Poitou with English donkeys, as a very useful and profitable race might be bred.

Cattle.

On three occasions only have the entries in this department been greater in numbers than they were at the recent Derby Meeting, for which 926 entries of cattle were received. Those occasions were: Park Royal, 1903 (944 entries); Windsor, 1889 (1,144 entries); and Kilburn, 1879 (1,005 entries). The Shorthorns were again the most numerous, the number of animals (319) constituting a record, exceeding by fifty-seven the previous largest entry of the breed made at Park Royal in 1905, when there were 262 entries.

Shorthorns.—There were ten classes as in 1905. The Judges in their report state "that the collection of Shorthorns was one of the best ever seen at a Meeting of the Society and does credit to the breeders." The winner of the first prize (No. 582) in Class 87 (bulls, calved in 1902 or 1903) was a grand bull full of quality, and a beautiful type of Shorthorn. In Class 88 (bulls, calved in 1904) there were sixty-three entries,

Mr. Gordon's *Fascinator*, a bull of grand quality, securing an easy win. The Judges found some difficulty in placing the next three animals; they were so evenly balanced as to points. Mr. George Harrison was awarded the second prize for *Charming Victor 2nd*, and also the third prize for *Royal Ensign*.

Class 89 (Bulls, calved in 1905).—First (No. 732), "A most wonderful bull for his age, being deep and having little fault to be found with him; in fact for his age one of the best we have seen for many years." Second (654), "Beautiful quality and a true type of Shorthorn." Third (696), "Very deep, heavy fleshed bull, might be a little better in head and horn, but well worthy of his position."

Class 90 (Cows, in-milk, calved previously to 1902).—Here were some of the best cows seen together for a long time. First (735), Champion heifer of 1903, retains most of her good points, including good dairy properties, with beautiful quality. This fine cow, *Sylph*, exhibited by His Majesty The King, is a daughter of the famous bull, "Royal Duke." Second (749), is of "beautiful quality, very level good flesh, and a real good animal." Third (750), was the Champion of 1904, but being now over eight years old, age is making its mark, but she still retains the beautiful quality she always had.

Class 91 (Heifers, calved in 1903).—First (761), is a very good heifer, deep in body, with level back, and a very easy winner. Second (764), a well-grown heifer, but not so evenly balanced as the first: "this and all the winners in the class show good dairy properties, which we are pleased to see breeders are paying attention to." Third (752), is of beautiful quality, but very small, which rather puts her a little lower in the list than she would have been.

Class 92 (Heifers, calved in 1904).—First (783), is a red and white heifer, good all round, very level, deep in body, and of nice character, very similar to the winner in the previous class; she is, in fact, from the same cow. Second (784), a roan, full of quality. Third (765), a "wonderful grown heifer, with nice character and quality, but not so level as those placed before her."

Class 93 (Heifers, calved 1905).—Here were some beautiful youngsters, showing that breeders still have an eye to quality. First (859), "a beautiful heifer well grown down, level, and a grand coat of hair; in fact, it was hard to find a fault with her: her beautiful hind-quarters gained her the Championship." Second (800), another grand animal, very similar to the first, but not so deep in body nor so nice in head, but still an easy second. Third (848), a roan, full of quality, and will improve with age.

Dairy Shorthorns.—Most of the animals in the three classes were shown in a natural healthy breeding condition. The greater proportion of them showed good milking qualities, though after being milked out several of the udders were disappointing.

Class 94 (12 entries, of which 10 were present).—Two failed to pass the test of giving at one milking 25 lb. of milk, or 20 lb., if calved before March 27. About half the remaining eight had good udders, the others, after being milked, being mostly very light in the fore part of the udder, and one, in other ways a very nice dairy cow, having her front teats very much too wide apart. The first and second prize cows were perhaps a little too bare in condition, but as some one suggested, a bag of bones, if healthy and with a good milk vessel, would do more towards paying the rent than a bag of grease. They both milked out extremely well, each giving a large quantity of milk and showing a very good level udder after milking.

Class 95.—A very small class of three, the first prize and Champion cow being an exceptionally nice type of Dairy Shorthorn with a good level capacious udder and teats well placed, a good bodied cow with a nice head and neck. The second prize cow was also a very handsome animal, but her udder was not one of the best, being a little too wide in front. The third prize cow was a nice type of dairy animal, and, although small, appeared to be a very good milker.

Class 96 consisted of three heifers, none being of exceptional merit, although all passed the test of giving 15 lb. of milk at the one milking, which for a second calved heifer was after all no very extraordinary performance.

Lincolnshire Red Short-horns.—The entries were small as regards numbers, but the quality was good. The younger bull and heifer classes were well filled, and contained animals of excellent merit.

Herefords.—There were fifty-nine entries of this breed. The first bull in Class 108 was an easy winner, and the other winners were useful animals. As a whole the males were much better than the females.

Devons.—The Judge reports that the exhibits as a whole were disappointing. The cows and heifers were hardly up to the average, due partly, no doubt, to Derby being so far from headquarters. There were, however, some very useful bulls.

South Devons.—The three bulls in Class 118 were very good, large, of good colour, and full of quality. Of the five entries in Class 119, the first prize cow was large, with good colour, deep in flesh, and away from the second and third animals, though these were also useful.

Sussex.—Class 121 (bulls, calved in 1902 or 1903) attracted only two entries. The winner, an excellent example of the breed, was awarded the Sussex Herd Book Society's Silver Medal for the best Sussex bull. The other classes contained exhibits from the most noted herds; and, with scarcely any exception, were of excellent quality.

Welsh Cattle.—Taken as a whole the entries were scarcely up to the usual standard. Five bulls competed in Class 127, for old bulls. The competition was very close for the first position between Messrs. Davies, Thomas & Howells' *Duke of Connaught* (1049) and Mr. Greaves' *The Czar* (1050), a winner on previous occasions. In Class 128 (yearling bulls), the two animals that competed were both "nice sappy young bulls, brimful of quality," the winner eventually taking the Champion against the old bull winner in the previous class. In the heifer class (130), in which six animals competed, No. 1062, a particularly nice level heifer, of undoubted quality, was an easy winner.

Red Polled.—These numbered forty-nine entries, which, as a whole, were fairly representative of the breed, the first prize bull (No. 1067) in Class 131 being an exceptionally good specimen.

Aberdeen Angus.—The Judge reports that the practice of permitting the ages of these animals to be calculated from December 1 allowed many more representatives of the breed to be entered, sixty-five competing in the six classes. The winner (No. 1157) in Class 141 (cows or heifers, in-milk, calved before December 1, 1903), a very good specimen of the breed, afterwards received the English Aberdeen Angus Cattle Association's Gold Medal.

Galloways.—The exhibits numbered twenty-one, and were, on the whole, very good. In Class 144, the first prize winner (No. 1191) was a very thick, well-fleshed bull, but rather undersized. No. 1200, the first prize animal in Class 145, was a "very thick stylish bull with a capital coat." Class 146 (cows in-milk) contained only three exhibits. The first was exceptionally good, and though shown in low condition, was quite fat enough for breeding purposes.

Highlands.—There were only two animals exhibited, both in the female section.

Ayrshires.—Only seven animals of this breed were exhibited. The Judge stated that the four bulls were the best he had ever seen. The three cows shown were also good specimens.

Jerseys.—The bulls were a representative display of the breed, the old bull class being very good; the classes for the younger bulls contained animals of merit. The cows were good on the average. The Judges report that Class 153, for old bulls, was small, but very good. The first prize was awarded to Captain L. G. Gisborne, for *Glorious Lad*, an aged bull of nice quality. The second, Lady de Rothschild's *Gallant*, was also of good quality. Class 154.—This class was not quite up to the level of the older animals. Class 155.—The winner

(1267, *Royal Ensign*) was above the average usually met with. The second (1264, *Alfriston's Pride*) was also a very nice promising young bull, and generally the class was good. Class 156.—The winner (1285, *Lady Viola*) was a fine cow of good quality. The second (1297, *Lady May*) was of different type and had dairy qualities of a high order. The third (1277, *Whitewood 5th*) had good dairy qualities. Class 157.—The first prize animal (1317, *Frolicsome 5th*) showed exceptional milking qualities for her age, with a good constitution; she well merited her position. The second prize went to the English-bred heifer (1309, *Watercress*). Class 158.—The first (1335, *Electress*) showed great promise and excellent outline; the second (1334, *Lady Madcap*) was of nice type, but not quite so strong in constitution; and the third (1330, *Marjory*) was quite of dairy type.

Guernseys.—Although the Show was held a long way from the districts in which the Guernseys are generally to be found, the entries were fairly representative. In the three classes for bulls a total number of eight animals only were exhibited: one in Class 160, for old bulls, three in Class 161, for two-year-olds, and four in Class 162, for yearlings. Of the cows and heifers the Judge reported that the cow class was fairly representative, and that the heifers were of good quality, more particularly those in Class 165, for yearlings.

Longhorns.—There were nineteen animals exhibited. The Judge reported that the section was good, on the whole, and that this old breed of cattle was improving very fast. The cows showed considerable improvement in their milking qualities.

Kerries and Dexters.—Of the four Kerry bulls exhibited, Lady Greenall's No. 1416, *Walton Rajah*, was awarded the first prize and Reserve Championship. The Duchess of Newcastle's cow (No. 1424), *Hardwick Flora*, was awarded the first prize in her class and the Challenge Cup for the best Kerry animal, which the Duchess has now won three years in succession. In the heifer class (174), Lady Greenall's *Walton Marsupial* (No. 1429) was awarded the first prize. Of the Dexter bulls, the Judge reported that they were a somewhat mixed lot, some showing good quality, others being coarse and ugly; he suggested that more attention should be paid by breeders to the class of bulls used in their herds. Class 177, for Dexter cows, was by far the best in this section—many of them wonderful little animals, giving an enormous quantity of milk for their size, with beautifully shaped bags and level bodies. The first prize, 1452, the Duchess of Devonshire's *Compton Daphne*, was run hard by Mr. de Bertodano's *Cowbridge Lorna*,

there being little to choose between the two; and 1458, *Sprucefield Edna*, was a good representative with an excellent udder.

Sheep.

The exhibits in this department showed a slight decrease, the total number of entries being 564, as against 591 in 1905. On this occasion the biggest entry was made in the Shropshire classes, the entries in which numbered 104, the Southdowns coming next with seventy-one entries, and Kent or Romney Marsh with sixty-four. Illustrations of the Champion sheep are given, in continuation of the series of horses and cattle illustrated in previous Volumes.

Oxford Downs.—The Judge reported that the sheep in these classes were of better quality and of more uniform character than in former years. The shearling rams (Class 182) were grand sheep, the prize winners being of very nice character and true to type. The ram lambs (Class 183) were exceptionally good. The shearling ewes (Class 184) and the ewe lambs (Class 185) were of nice quality.

Shropshires.—As is usual at the Royal Show, Shropshire sheep made a good display. The classes were well filled, and the quality throughout was decidedly good. The Judges reported as follows:—

Class 186 (Two-shear rams) was headed by a very symmetrical wide sheep (No. 1526), wonderfully developed. Second to him came a very stylish ram (No. 1520), with a good head and fleece, the Reserve going to No. 1525, a big well-grown ram of good character.

Class 187 (Shearling rams).—We had no difficulty in awarding first prize here. The winner (No. 1538) is an exceptionally nice sheep, good in character, with size and quality. Second to him we placed a ram (No. 1548) with a capital head and fleece, and one of great substance. The third prize winner (No. 1535) is a nice gay sheep, with capital fleece and skin. Several other very useful animals followed, and received honourable mention.

Class 188 (Five shearling rams).—This very attractive class brought out some really good sheep. We placed No. 1573 first, a pen of great scale and substance. These were followed by No. 1560, second, and No. 1562, third, two pens of nice well-grown sheep. Some other pens followed which did not reach the winners in size, but were of great merit, containing some most classy animals.

Class 189 (Special selling (auction) shearling rams).—Here again No. 1538, winner in Class 187, heads the list, followed by No. 1535, which gets a place higher owing to the second prize winner in Class 158 not being entered. The third, No. 1576, was a nice lengthy sheep shown in the second prize pen of five. The fourth was No. 1560A.

Classes 190 (Ram lambs) and 192 (Ewe lambs) were very even throughout, and there was very little difference in the winning pens.

Class 191 (Shearling ewes) brought out some typical Shropshires. The four winning pens were of exceptionally high merit.

Southdowns.—Class 193 (Two-shear rams).—The Judges report that this was a somewhat disappointing class, many of the sheep being overfed. Class 194 (Shearling rams).—

FIG. 1.—SOUTHDOWN SHEARLING RAM.
Winner of Champion Prize for best Southdown Ram, Derby, 1906.
Exhibited by HIS MAJESTY THE KING.

Journal R.A.S.E., Vol. 67, 1906

FIG. 2.—SOUTHDOWN SHEARLING EWES.
Winners of Champion Prize for best Pen of Southdown Ewes or Ewe Lambs, Derby, 1906.
Exhibited by THE DUKE OF DEVONSHIRE, K.G.

FIG. 3.—HAMPSHIRE DOWN RAM LAMBS.

Winners of Champion Prize for best Pen of Hampshire Down Ram or Ewe Lambs, Derby, 1906. *Exhibited by* MR. JAMES FLOWER.

FIG. 4.—LINCOLN SHEARLING RAM.

Winner of Champion Prize for best Lincoln Ram, Derby, 1906.

Exhibited by MR. HENRY DUDDING.

The winner (No. 1625) is a very active, good specimen of the breed; the second (No. 1627) and third (No. 1636) are indifferent in their movements, but otherwise they are good sheep. No. 1625, exhibited by His Majesty The King, was eventually the Male Champion (see Fig. 1, opposite to page 144). Class 195 (shearling rams) was well filled, but was not of an even character. No. 1645 made a nice level pen and were easy winners. Class 196 (ram lambs).—No. 1651, first prize, was a very good pen, followed closely by the second (No. 1659) and third prize (No. 1653) pens. Class 197 (shearling ewes).—A very good class. The first (No. 1665), second (1663), and third (No. 1667) prize animals were very close together. The first prize pen eventually took the Female Championship. These were exhibited by the Duke of Devonshire (see Fig. 2 opposite to page 144). Class 198 (ewe lambs).—One of the most even classes in the Show. The first (No. 1669), being an exceedingly good pen, was placed Reserve for the Female Championship; the second (No. 1677) and third (No. 1673) were also very good pens.

Hampshire Downs.—In the two-shear ram class (199), the first prize ram (No. 1681) showed rare flesh, colour, and coat. Class 200 (shearling rams) contained some typical sheep, but the first (No. 1694) and second (No. 1695) prize rams were much in front of the others, both being really grand sheep, showing all the best characteristics of the breed; the winner was a grand specimen. A good entry of ram lambs in Class 201 showed careful breeding, the first prize pen (No. 1709) being quite the best sorted seen for years. This pen, exhibited by Mr. James Flower, received the Championship (see Fig. 3 opposite.) The second prize pen (No. 1706) were also a credit to the breed, and other entries were of considerable merit. There were no entries of shearling ewes.

The ewe lambs (Class 203) showed such uniform character that the Judges were some time before finally arriving at a decision; eventually No. 1723 won, being closely pressed by the second prize pen (No. 1722). The third prize was awarded to No. 1728. The whole class was a credit to the exhibitors.

Suffolks.—Class 204 (two-shear rams), although containing only three exhibits, was very satisfactory, as all were of sufficient merit. Class 205 (shearling rams), with seven exhibits, was one of the strongest of the Suffolk sheep. The first, second, third, and Reserve Number were fine specimens of the breed, and were very close in merit. Class 206 (ram lambs).—The first, second, and third prize animals were of beautiful quality and well grown. Class 207 (three ram lambs).—This class,

with four exhibits, were all good, the first and second prize animals particularly so. Class 208 (shearling ewes).—This class, although containing only three exhibits, was exceptionally fine, and never, thinks the Judge, have there been two better pens of ewes shown than the first and second prize pens. Class 209 (ewe lambs).—The first, second, and third prize pens in this class were well grown and fine specimens of the breed.

Lincolns.—This breed was well represented and the exhibits were of very high quality. In Class 212, for five shearling rams, fifty animals of very high merit were exhibited. The ram lambs (Class 213) were very good, and the shearling ewes, in the opinion of the Judges, were as near perfection as they had ever seen. They also consider that the Champion sheep, Mr. Henry Dudding's shearling ram (No. 1781), is quite one of the best that has ever been exhibited (see Fig. 4, opposite to page 145).

Leicesters.—Of the nine exhibits in Class 216 (shearling rams), the first prize animal (No. 1824) is a beautiful upstanding sheep, with good skin and firm mutton. The second prize sheep (No. 1821) was a typical Leicester, with many good points, but had rather light skin; the wool showed great quality when opened and carefully examined. The third prize sheep (No. 1825) was a very useful and thoroughly typical sheep, with good skin and clean bone. The ram lambs in Class 217 were forward in condition, and looked blooming and well in their coats. The first prize pen (No. 1829) were very good lambs indeed, and the first (No. 1838) and second (No. 1839) prize winners in Class 218 (shearling ewes) stood out alone. With one exception the whole of the ewe lambs in Class 219 were quite up to the usual standard of excellence.

Cotswolds.—An average collection. The first (No. 1847) and second (No. 1849) prize sheep in the shearling ram class (220) were grand specimens of the breed. The same may be said of the shearling ewe class, and the lambs were very strong, but a short entry.

Border Leicester Sheep.—In Class 224 (shearling rams), the quality was of average merit, and the winner (No. 1862) showed the best points of the breed. The competition in Class 225 (ram lambs) and in the succeeding classes was limited.

Kent or Romney Marsh.—The representation of this breed, numbering sixty-four entries, was the largest since the Maidstone Meeting of 1899, when there were eighty-six entries. The two-shear rams (Class 228) were of good type and wool. Class 229 (shearling rams) was well filled with twenty-one entries of excellent sheep, seldom seen together,

FIG. 5.—DORSET HORN RAM LAMBS.

Winners of Champion Prize for best Pen of Dorset Horn Ram Lambs, Shearling Ewes, or Ewe Lambs, Derby, 1906. *Exhibited by* MR. JAMES ATTRILL.

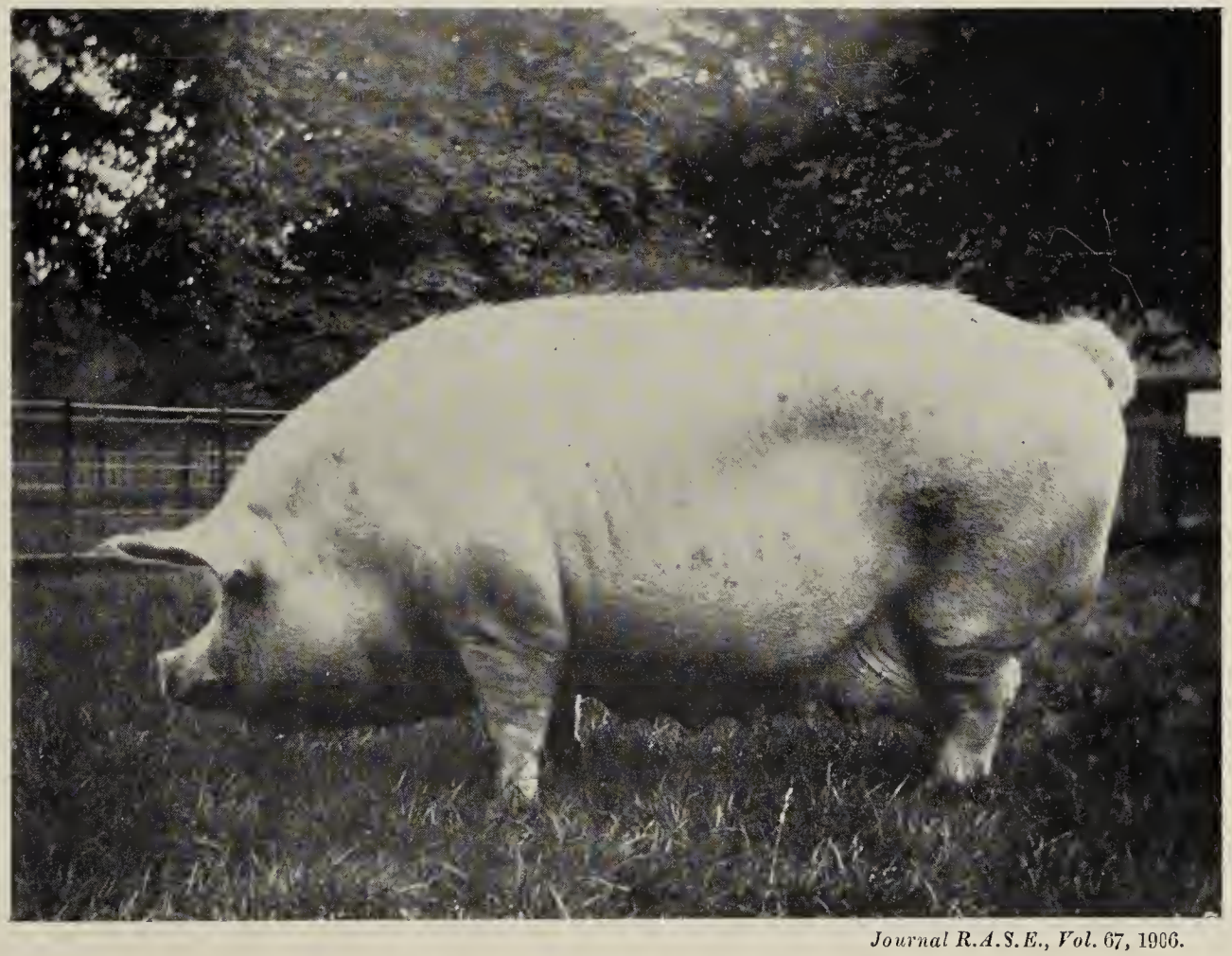

FIG. 6.—LARGE WHITE BREEDING SOW, "LINDSEY A."

Winner of Champion Prize for best Large White Boar or Sow, Derby, 1906.

Exhibited by SIR GILBERT GREENALL, BART.

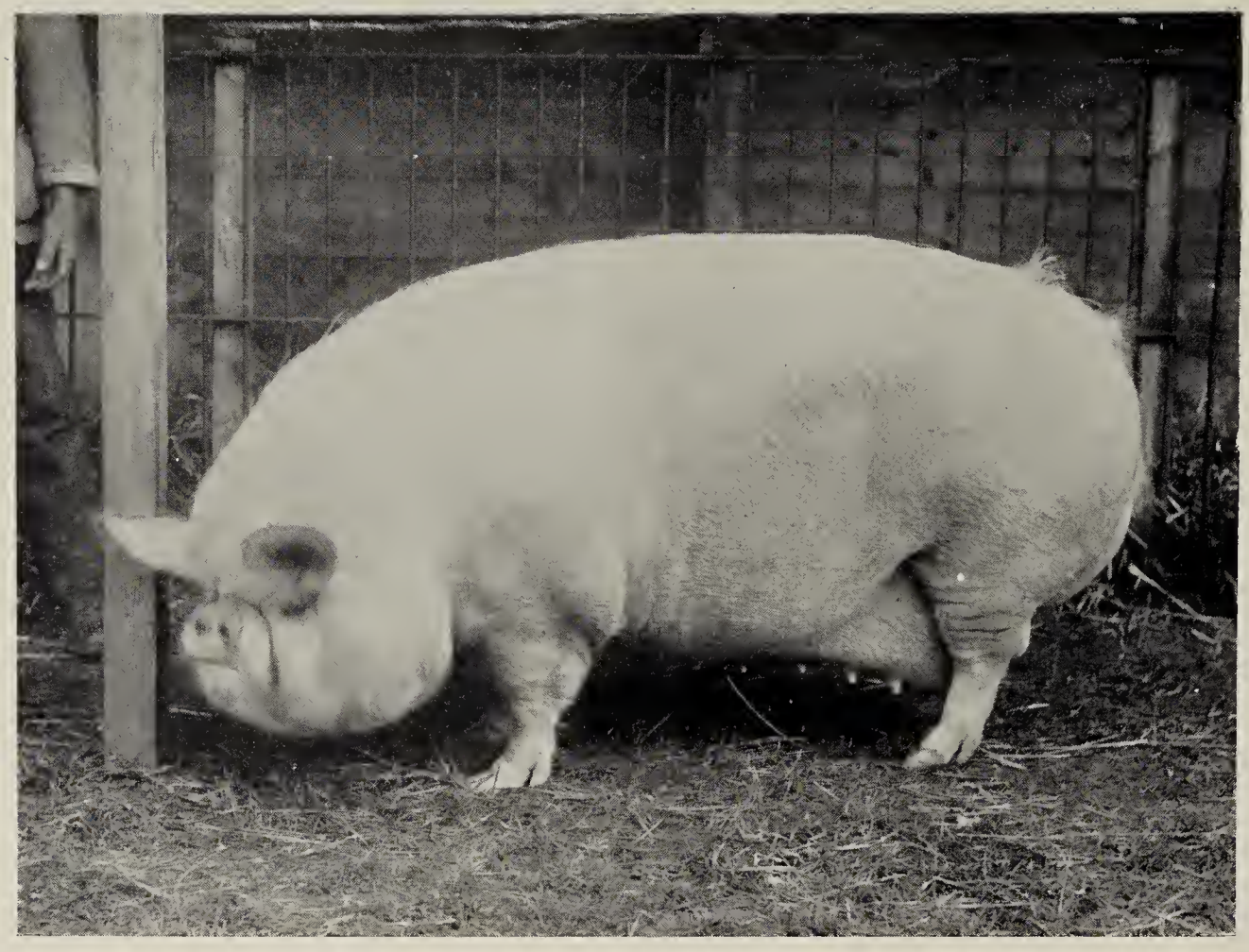

FIG. 7.—MIDDLE WHITE BREEDING SOW, "HOLYWELL VICTORIA DUCHESS."
Winner of Champion Prize for best Middle White Boar or Sow, Derby, 1906.
Exhibited by MESSRS. SANDERS SPENCER AND SON.

FIG. 8.—TAMWORTH SOW, "CHOLDERTON BUZZER."
Winner of Champion Prize for best Tamworth Boar or Sow, Derby, 1906.
Exhibited by MR. ROBERT IBBOTSON.

with plenty of bone, and, with one or two exceptions, showing great improvement in the wool. In Class 230 there were three or four pens of good lambs, but the remainder showed room for improvement. The shearling ewes (Class 231) were of exceptional merit, showing more uniformity of type and good wool—a great improvement generally. Class 232 (ewe lambs) contained two or three pens of fairly good lambs, but the remainder were rather weak.

Wensleydales.—The exhibit of Wensleydales was a smaller one than usual, but the type and quality were good. The winning shearling ram (No. 1940) in Class 233 and the first prize pen of shearling ewes (No. 1947) in Class 235 are worthy of special mention. The lambs were young and rather small, but the winning pens of each sex had all the qualifications necessary for growing into typical sheep.

Dorset Horn.—These classes were well contested throughout, the exhibits being uniformly typical. The pen of ram lambs (No. 1958), to which the breed Championship was awarded, was of especially high merit (see Fig. 5, opposite to page 146).

Devon Long Wools.—There were only ten pens entered from two flocks, but the animals shown were of excellent quality.

South Devon, Dartmoor, and Exmoor.—The exhibits were few in number, and the Judge reports that the South Devons were very good, the Dartmoor rams not up to their usual standard, but the ewes were better. The Exmoors were fairly good, the ewes being well woolled, but rather small.

Cheviots.—The Judge reports that the general character of the exhibits, which numbered six only, was very high.

Black-Faced Mountain.—Class 252 (rams, shearling and upwards).—This was a very creditable display, including several animals of considerable merit, very well bred, and brought out in good bloom. The shearling ewes in Class 253 were well brought out on the whole, and the first prize winners (No. 2012) would not easily be beaten.

Lonks and Herdwicks.—The two Lonk rams exhibited in Class 254 were very good samples. The first prize was awarded to No. 2016, and the second to No. 2015. In Class 255, for Lonk shearling ewes, the competition between the two exhibits was very close, No. 2019 being placed first and No. 2018 second. The Herdwicks were remarkably good exhibits, but only three animals competed in Class 256, for rams one year old and upwards, and two pens of ewes in Class 257.

Welsh.—In his report on these classes the Judge states that they were well patronised and that the quality was good,

especially the shearling ewes in Class 259, which contained pens of exceptional merit rendering it difficult to decide between them. There were two outstanding exhibits in Class 258, for rams, shearling and upwards, viz., the first (No. 2028) and second (No. 2030) prize winners.

Ryeland.—The exhibits were not numerous, but the quality of the animals shown was good. In Class 259A, for rams, two-shear and upwards, three animals competed, and five shearling rams were shown in Class 260. There were also five pens of shearling ewes exhibited in Class 261.

Pigs.

The number of entries, 266, was the highest on record, and the exhibition of pigs was perhaps the finest ever seen at the "Royal" or any other Show. No prizes were offered for Small Whites, but the classification of 1905 was adopted for the other breeds, with the addition of classes for sows farrowed in 1905, for Large Whites, Middle Whites, Berkshires, and Tamworths, making in all twenty-four classes. Illustrations are given of the Champion and first prize pigs.

Large Whites.—The exhibits as a whole were of excellent quality, the breeding sows (Class 264) being a strong class. The Championship was won by Sir Gilbert Greenall, with a sow, *Lindsey A.* (see Fig. 6, opposite to page 146).

Middle Whites.—The Judge considered the exhibits above the average. Class 269 (breeding sows) was an extraordinarily good one. The winner, Messrs. Sanders Spencer & Sons' *Holywell Victoria Duchess* (No. 2136) was a true typical sow, full of quality (see Fig. 7, opposite to page 147).

Berkshires.—All the classes were well filled, and the Judge reports that, on the whole, the quality was good. More evenness of type is, however, still desired. The first prize boar and sow are illustrated (see Figs. 9 and 10 opposite).

Tamworths.—The entry in Class 277 was poor, several boars being very dark and not of much quality. The winner (No. 2225), though an old boar, had good length and depth, and a grand head: the second prize boar was of grand colour, but rather short. The winner in Class 279 won very easily, and is a grand sow; she also was awarded the Championship for the best pig (see Fig. 8, opposite to page 147). Class 280 was indeed, especially the winner, full of quality, the second and third and Reserve Number being good pigs true to type.

Large Blacks.—All the classes were very well filled with pigs of excellent quality, and exceedingly well grown,

FIG. 9.—BERKSHIRE BOAR, "OKEFORD EMPEROR."
Winner of First Prize for Berkshire Boars, farrowed in 1904 *or* 1905. *Derby*, 1906.
Exhibited by MR. R. W. HUDSON.

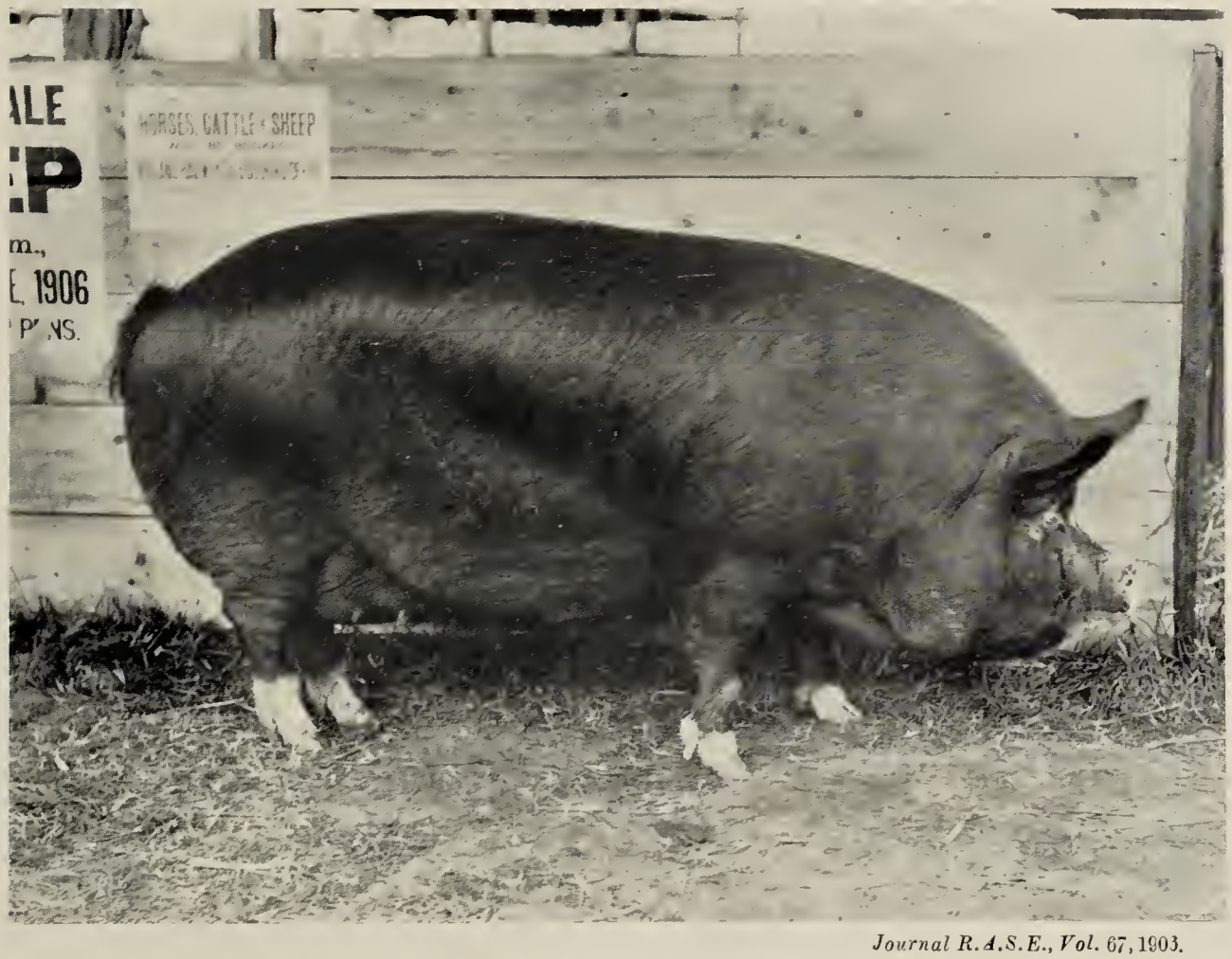

FIG. 10.—BERKSHIRE SOW, "WANDSWORTH GEM."
Winner of First Prize for Berkshire Breeding Sows, farrowed in 1902, 1903, *or* 1904, *Derby*, 1906, *Exhibited by* THE VISITING COMMITTEE OF THE MIDDLESEX COUNTY ASYLUM.

FIG. 11.—LARGE BLACK BOAR, "HASKETON BLACK KING 4TH."
Winner of Champion Prize for best Large Black Boar, Derby, 1906.
Exhibited by MR. C. F. MARRINER.

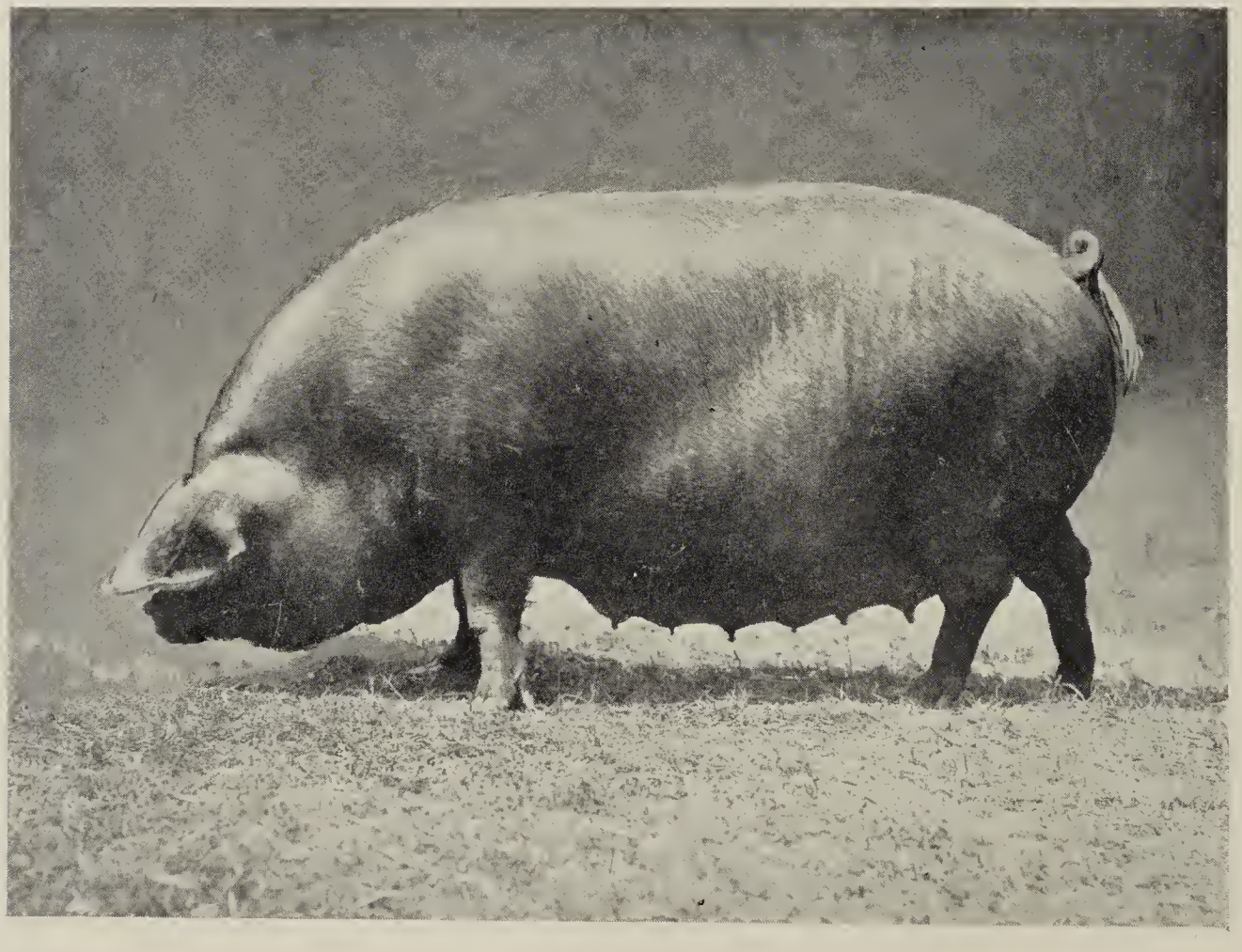

FIG. 12.—LARGE BLACK SOW, "HASKETON LONG LADY."
Winner of Champion Prize for best Large Black Sow, Derby, 1906.
Exhibited by MR. C. F. MARRINER.

competition being very keen. The sow class was of exceptional merit. Both Male and Female Championships were gained by Mr. C. F. Marriner (see Figs. 11 and 12 opposite).

POULTRY, INCLUDING DUCKS, GEESE, AND TURKEYS.

In this department three Judges were appointed to deal with the entries, which numbered 811, as against 871 in 1905. Mr. P. Proud judged the Game fowls, Brahmas, Cochins, Langshans, Plymouth Rocks, Wyandottes, and Orpingtons; the late Mr. J. P. W. Marx judged the Dorking, Sussex, French, Minorca, Leghorn, Ancona, and Andalusian breeds; and Mr. H. Abbot judged the Table fowls, Ducks, Geese, and Turkeys. The following remarks are taken from their reports :—

Fowls.—The adult classes of *Old English Game* were very good indeed, and were keenly contested, but the two classes for chicks were very poor. All the four classes of *Indian Game* were a really grand lot, and the winners difficult to separate. *Brahmas* and *Cochins* were just fair. *Langshans* were a nice display, the quality being quite up to the average. *Plymouth Rocks* were a grand lot both in numbers and quality; more especially so in the young bird classes. *Wyandottes* were quite a show in themselves, numbering 168, and the quality all through was excellent, the competition being very keen. *Orpingtons* were another grand lot and numbered 128. The Buffs still hold their own in point of both quality and numbers. The adult blacks were a nice collection, but the two young classes were disappointing. White Orpingtons appear to be making great headway, and were a very pretty display.

The *Dorking* classes attracted a few more entries than last year, and the quality throughout was extremely good. The entries of *Sussex* birds were, as might be expected, less than in 1905, seeing that these fowls are peculiar to the southern Home Counties. The exhibits were more uniform in type and colour than heretofore. All the *French* classes were good. *Minorcas* were a great improvement on last year; the hen and both chicken classes were worth special mention.

The six classes for *Leghorns* filled very well indeed. The two classes for the brown variety were the best; in the others the purity of colour of the whites and delicate hue of the buffs was, with one or two exceptions, destroyed by the sun and weather. The exhibits of *Anconas* were of good quality, though the classes filled badly. The number of *Andalusians* was small, but in each class the winner was a splendid specimen; the hen was particularly good. The four *Table Fowl* classes were small, but the specimens exhibited were well grown and

well fattened. The shortness of entries in these classes is accounted for by the cold and late spring.

Ducks.—*Aylesburys* made a creditable show, but *Rouen* were disappointing both in numbers and quality; the same may be said of *Pekins* and *Cayugas*.

Geese.—The entries were small, but the specimens of each variety were very good.

Turkeys.—The classes were fairly large, and some splendid specimens were on view.

Farm and Dairy Produce.

Butter.—The first and second prize exhibits in Class 394 (butter made with not more than 1 per cent. of salt) were very good. In Class 395 (fresh butter) there were fifty-nine entries, and naturally there were some excellent specimens.

Cream.—This was only an average class as regards quality, several of the samples being sour, and others affected by the use of preservatives. The prize lots were clean in flavour and of a desirable consistency.

Cheese.—The Cheddar cheese was somewhat irregular in quality, many of the samples being sweet-made and tough; in consequence the quality and flavour were faulty. The prize lots in both classes were clean in flavour, and showed excellent quality. The first prize truckles were quite outstanding in merit, and were easily the finest sample in the Cheddar classes. The exhibits of Cheshire cheese were up to a high standard considering the season of the year. Several of the samples were rather tightly made, and showed over-acidity in the curd, which is considered a serious fault in a Cheshire cheese. The prize lots were quite outstanding in quality and flavour, and were fine samples of this variety of cheese. The Stilton cheese was quite the best in the section, and the exhibits throughout were up to a high standard of merit. The first and second prize exhibits were of fine quality and flavour. The exhibits of Double Gloucester cheese were rather disappointing, and nothing attractive was found, faulty flavour and openness being the principal faults. The Derbyshire cheese was also somewhat irregular in quality. The prize lots were useful samples. The first and second prize Cream Cheeses were excellent, but the balance of the exhibits in Class 404 were only moderate in quality.

Cider and Perry.—The ciders and perries were inspected on June 7, and several samples from each class were selected and taken by Dr. Voelcker for analysis. The final judging was on June 27, when it was found that several samples had deteriorated in quality, while others had improved. Class 405 (Cider,

in cask, made in the autumn of 1905 : 18 entries).—Several of the exhibitors had sent poor quality ciders. One competitor had used some kind of flavouring essence, quite spoiling his cider. The first prize (No. 3317) went to an excellent cider, very clean, with fine flavour and aroma. The second prize sample (No. 3316) was also very good, but rather more bitter. The third prize (No. 3326) went to a rather thin tasting juice. Class 406 (Cider, in bottle, 1905) was the best cider in the whole competition. The first prize lot (No. 3349) was excellent, very clean and brisk, with a nice natural gas, and a fine aroma, made from "Kingston Black" apple alone. The alcoholic strength was rather low. For the second prize (No. 3347) another clean and brisk cider was selected, with not quite such a fine aroma. The third prize (No. 3333) was given to a very sweet and rich cider. Class 407 (Cider, in bottle, made before 1905).—The first prize (No. 3367) was given to a very clear, clean, fine cider, with nice gas and aroma. The second prize winner (No. 3358) was excellent, but very sweet ; while the third prize lot (No. 3369) had not such a good aroma.

Class 408 (Perry, in bottle, made before 1905.)—This class was not so well filled, and the samples were not of so good average quality. The first prize was awarded for No. 3377, which was bright, clean, and good, with a good aroma. The second prize went to No. 3371, which had not such a nice aroma, and in the third (No. 3370) the aroma was slightly unpleasant.

The following are the results of the chemical analyses which relate to the samples that gained prizes or commendation :—

Class 405.

No.	Specific gravity	Total solids	Alcohol	Acidity	Award
		per cent.	per cent.	per cent.	
3317	1·0254	7·68	3·41	·251	1st Prize
3316	1·0235	6·84	3·14	·341	2nd Prize
3326	1·0306	8·73	3·26	·378	3rd Prize
3330	1·0220	6·82	4·02	·351	R. N. & H. C.
3323	1·0347	9·55	3·43	·685	Com.
3328	1·0235	7·51	4·20	·348	Com.

Class 406.

3349	1·0537	13·71	2·12	·793	1st Prize
3347	1·0378	9·97	2·55	·500	2nd Prize
3333	1·0417	10·63	1·15	·291	3rd Prize
3334	1·0291	7·93	2·28	·325	R. N. & H. C.
3336	1·0277	8·49	4·27	·435	H. C.

CLASS 407.

No.	Specific gravity	Total solids	Alcohol	Acidity	Award
		per cent.	per cent.	per cent.	
3367	1·0276	7·82	3·02	·391	1st Prize
3358	1·0323	9·07	2·56	·412	2nd Prize
3369	1·0265	7·88	3·73	·341	3rd Prize
3360	1·0229	6·79	3·12	·391	R. N. & H. C.
3365	1·0294	8·20	2·84	·361	H. C.

CLASS 408.

3377	1·0430	11·49	2·56	·720	1st Prize
3371	1·0303	8·79	4·14	·581	2nd Prize
3370	1·0321	10·63	3·37	·435	3rd Prize
3376	1·0484	12·12	1·00	·603	R. N. & H. C.

Wool.—Nine classes were provided, and were fairly well filled, the total entries numbering sixty-one. Class 409, for Leicester or Border Leicester wool, was fairly characteristic, with, however, two exceptions, which had too much of the Lincoln strain. Class 410, for Lincoln wool, was a very good one all round. Class 411, for Kent or Romney Marsh wool, was fairly representative ; but several of the lots ran tender in staple. Class 412, for "Any other Long wool," was filled with miscellaneous wools difficult to judge satisfactorily ; they comprised Devon, South Devon, Cotswold, and Wensleydale wools. Class 413, for Southdown fleeces, was of a very high standard and well got up. Class 414, for Shropshire wool, was well represented ; one fleece of unwashed wool should not, however, have competed with washed wool. Class 415, for "Any other Short wool," was a very nice one, more in keeping with its description than the corresponding Long wool class. Class 416, for Welsh wool, was not thoroughly representative of the term "Welsh," being crossed apparently with Shropshire and Ryeland. Class 417, for Scotch wool, made but a poor competition.

Hives, Honey, &c.—The classification in this department was the same as in 1905, and considering the early date at which the Show was held, the honey section was very good indeed. The display as a whole was perhaps the best that has been seen for some years, and apparently the arrangement whereby the country is divided into two groups—north and south—has worked satisfactorily. The entries in the fourteen classes for honey and wax numbered 154, and the competition was in all cases exceptionally keen.

Horse-shoeing Competitions.—Prizes amounting to 16*l.* were offered in classes open to shoeing smiths from all parts of the United Kingdom, the entries numbering thirty-three in Class I. (Hunters) and forty-nine in Class II. (Cart horses). The Judges reported that the work done by the competitors in Class I. was very good. In the second class the competitors displayed much skill, and in addition to the four prize winners nine others received commendations. The competition in both classes was very keen, a few points only dividing the prize winners in each. The Freedom of the Worshipful Company of Farriers was awarded to the prize winners in each class. Twelve candidates were examined for admission to the Register of Shoeing Smiths, of whom seven satisfied the Judges of their efficiency.

It is gratifying to be able to record that the first Country Meeting held by the Society on its return to the provinces was an unqualified success, both financially and from the point of view of exhibits; and the expressions of satisfaction by exhibitors and visitors alike would appear to indicate that the decision of the Council to revert to the migratory system was a popular one.

THOMAS MCROW.

16 Bedford Square, W.C.

THE TRIALS OF SUCTION GAS PLANTS AT DERBY, 1906.[1]

Judges { Capt. H. Riall Sankey, R.E. (ret.), M. Inst. C.E.
Prof. W. E. Dalby, M.A., B.Sc., M. Inst. C.E.

The combination known as a suction gas plant, in which a gas engine provides, by means of its suction stroke, the draft necessary to make the fuel burn in a producer, is of very recent origin. As regards the Royal Agricultural Society, the first exhibit was made in 1901 at Cardiff by Messrs. Crossley Bros., Ltd. Then at the 1903 Show at Park Royal a suction gas plant was exhibited by the Dowson Economic Gas and Power Company, Ltd., which was a combination of a Dowson producer with a National gas engine. Messrs. Crossley Bros., Ltd., also exhibited a suction gas plant at this Show. At the 1904 Show three such plants were entered, and at the 1905 Show the number had increased to four.

This increase in exhibits of suction gas plants, together with the claims set forth by the makers in respect of the reliability and economy of such plants, was mainly responsible for the decision to hold the trials now being reported on. The response of the makers was beyond expectation. Fourteen plants were entered for trial and many others were exhibited. All the fourteen plants started on Monday morning, June 18, but three of them were withdrawn during the trials. The list of the competing plants is given in the Table on page 155.

Object of the Trials.

Regarded from the point of view of the Royal Agricultural Society, the object of these trials was to determine, so far as a series of trials extending over one week would permit, whether suction gas plants could be relied on to work for agricultural purposes, day in and day out, with the same degree of freedom from breakdowns as a steam engine, and with the same small amount of attendance as is required by an oil engine. Satisfactory answers to these questions would prove the suitability of such plants for agricultural purposes, because there is no doubt as to the great improvement in fuel economy, as compared with either a steam or an oil engine of the same power.

One of the most important factors in judging the merits of the various plants was the fact that these combinations of

[1] Abridged from the Official Report on the Trials. 8vo., 56 pp., 25 illustrations, price 1*s*. John Murray, London, 1906. Copies of the complete Report are obtainable through any bookseller, or by Members direct from the Society.

Table giving particulars of Suction Gas Plants submitted for Trial.

No. in Catalogue	Name and address of exhibitors	Catalogue B.H.P.	Name of producer	Name of engine	Revs. per min.	Stroke	Diam. of cylinder	Declared B.H.P.		Price of plant (declared)	Price per declared B.H.P.		Remarks.
								Anthracite	Coke		Anthracite	Coke	
						In.	In.			£	£	£	
7	The National Gas Engine Co., Ltd., Ashton-under-Lyne	20	National .	National .	190	18	10	20	20	233	11·65	11·65	
8	Railway and General Engineering Co., Midland Engineering Works, Nottingham	20	Dowson .	Railway & General	170	18	12	20	20	199	9·95	9·95	Compressed air self-starter.
9	Davey, Paxman & Co., Standard Iron Works, Colchester	15½	Paxman .	Paxman .	220	15	9½	15·5	15·5	210	13·55	13·55	Three-step hit-and-miss governor. Paxman's Patent timing apparatus. Compressed exhaust gas self-starter.
11	The Dowson Economic Gas and Power Co., Ltd., 39 Victoria Street, S.W.	20	Dowson .	National .	190	18	10	20	20	200	10·00	10·00	
12	The Campbell Gas Engine Co., Ltd., Halifax	18	Campbell.	Campbell.	200	19	9½	18	17	180	10·00	10·59	Variable timing gear. Renewable seats to valves.
13	The Campbell Gas Engine Co., Ltd., Halifax	20	Campbell.	Campbell.	190	20	10	20	18	225	11·25	12·50	Throttle governor. Renewable seats to valves. Variable timing gear.
16	The Dudbridge Iron Works, Ltd., Stroud, Gloucestershire	20	Dudbridge	Dudbridge	200	17	9¾	20	20	193	9·65	9·65	
17	The Mersey Engine Works Co., Sefton Street, Liverpool	20	Mersey .	Gardner .	200	18	9	20	20	176·5	8·82	8·82	
19	E. S. Hindley & Sons, Bourton, Dorset .	20	Hindley .	Hindley .	600	7	7	16	—	280	17·50	—	Vertical engine. Two cylinders. Variable timing gear.
20	Kynoch, Ltd., Holford Engine Works, near Birmingham	17	Kynoch .	Kynoch .	240	18	9	17	17	198	11·65	11·65	Petrol self-starter.
21	Newton Bros., Market Place, Derby . .	20	Newton .	Newton .	200	18	9	20	—	210	10·50	—	Vertical engine.
28	Fielding & Platt, Ltd., Gloucester. . .	20	Fielding .	Fielding .	220	18	9½	18	18	200	11·10	11·10	
30	Crossley Bros., Ltd., Openshaw . . .	17	Crossley .	Crossley .	200	21	8½	17	—	200	11·77	—	Exhaust regenerative type of producer.
31	Crossley Bros., Ltd., Openshaw . . .	15	Crossley .	Crossley .	180	21	8½	15	13	180	12·00	13·85	

Except as otherwise stated the engines were single cylinder single acting 4-cycle (Beau de Rochas, generally known as "Otto" cycle) horizontal type, and were governed on the hit-and-miss principle.

producers and engines would, in many cases, be placed in the hands of agricultural labourers, to whom very little discretion could be given in mechanical matters ; and therefore means of adjustment intended to obtain some small economical advantage would not be of the same value as when in the hands of a skilled attendant.

The size of plant fixed upon for trial was from 15 to 20 B.H.P., this size being suitable for threshing and other agricultural purposes.

Discussion of the Regulations.

The principal regulations issued by the Society, under which the trials were carried out, were as follows:—

1. The plant to consist of gas generating plant and engine, complete, of 15 to 20 B.H.P. as a maximum.

2. Each engine must be fitted with a rope or web brake on the flywheel, water trough in wheel for cooling, indicator cock and gear, revolution counter and explosion counter, to be approved by the Society's Consulting Engineer. Water will be found by the Society.

3. One attendant must be in constant charge of each plant to give any information which the Judges may require. Any attention actually given by him to the working of the plant will be noted.

4. Each exhibitor will declare at what B.H.P. he intends to run his engine for the full load trial, and no variation therefrom beyond 5 per cent. more or less will be allowed.

5. Full load, half load, and light or no load trials will be made with uniform selected anthracite coal provided by the Society. A subsequent full load trial will be made with coke as fuel. Each plant will be started from cold on the full load trial. The first full load trial will be commenced with the gas generators empty.

6. A given quantity of coal will be weighed out to each competitor, the time of lighting up will be noted, and so soon as sufficient gas has been generated and the engine is running at full power the time will be taken. This time will be recorded as the commencement of the run, so far as fuel consumption is concerned.

7. The engines will run for nine hours under constant load, after which they will be shut down for the night, and will resume running on the following day. At the conclusion of the trials the fires will be drawn, and any unconsumed coal will be weighed back and credited for what it may be worth.

8. The half load trials will be conducted on precisely the same lines as the full load trials, with the exception that they will be of shorter duration.

9. The light or no load trial will be of two hours' duration. No coal consumption will be recorded for this trial. No working of the fan by hand will be permitted during the half load and light or no load trials.

10. On the completion of the above trials, one full load trial of nine hours' duration will be made, using coke as fuel.

11. The points to which special attention will be directed are:—

(1.) Attendance necessary.
(2.) General design — including facility of cleaning — and space occupied.
(3.) Regularity of working.
(4.) Fuel consumption. Water consumption.
(5.) Price.
(6.) Relative proportions of gas producer and engine.
(7.) Volume swept by piston relative to B.H.P.

Before proceeding to a description of the plants and of the trials carried out it is desirable to make a few remarks on these regulations, in order to indicate the general considerations which guided the Judges in the inquiries and observations they made during the trials, and in making the award.

In the first place it is to be borne in mind that it was the combination of producer and gas engine that was being judged, the former, however, owing to its comparative novelty, requiring most attention and criticism. It may also be pointed out that with two exceptions the engines themselves were of the usual horizontal type, and embodied the results of the long experience of the various makers.

1. *Attendance necessary.*—An important distinction must be drawn between the attendance required for starting the plant and that needed for looking after it when running, that is, for attending to the lubrication and for filling the hopper with coal. Should additional help be needed at starting for turning the flywheel, little or no additional expense is incurred. During running only one attendant is needed at most, and, if the plant is quite reliable, it can in many cases be left to itself for comparatively long periods, and the attendant can perform other duties during such periods. The attendance required during running is thus in a measure dependent on the regularity of the working or reliability of the plant. Some of the engines were fitted with self-starters (see Table on page 155), and it is clear that, with engines of the size under trial, the only gain is to save the small expense above referred to for starting, whereas extra complication and chances of failure are introduced by the starting apparatus itself.

2. *General design, including facility of cleaning, and space occupied.*—A simple straightforward design is the desideratum. Since the main lines of the design of the gas engines were, except in two instances, common to all, the details were the points which had to be most carefully considered. As regards the producers they followed closely the lines of the "Dowson" producer, and therefore differences were investigated; they were principally confined to arrangements which aimed at reducing the difficulties caused by clinker, to means of regulating the air and water supply and for increasing the regenerative effect of the suction producer. Hard water may cause trouble by "scaling," and this is a matter of great importance; but the relative immunity of the various producers in this respect could not be tested in the short time available, and therefore could only be gauged by general considerations. The design of the plant in respect of provision against possible escape of poisonous gas or risk of explosion required careful consideration.

The suitability of the design for manufacturing on the interchangeable system comes under this heading. It is a specially important matter for agricultural engines to insure that spare and repair parts shall go into place without fitting.

The regularity of running, when using coke as a fuel, depends on the amount of tar deposited on the valve seats. In the present state of the art no adequate provision can be made in the producer for preventing the formation of tar if the coke contains it in any material quantity. The ease with which the valves can be got at and cleaned is therefore of more than usual importance, and much stress was laid on this point. In this connection it is well to point out that gas coke varies considerably in regard to its freedom from tar, and it is to be hoped that when suction gas plants become more general, an arrangement will be made whereby some standard of permissible percentage of tar can be insured. The following points also come under this section : Ease of dismantling connecting-rod and piston, also main bearings; the method of attaching the cylinder to the frame; the various important scantlings, especially those of moving parts; the material used and the workmanship, especially with regard to interchangeability; the lubrication of the bearings, of the cylinder and of the piston.

No comment is needed as regards the space occupied.

3. *Regularity of working.*—Apart from the effect tar has on the valves, as already pointed out, the majority of the engines can be relied upon for working with a minimum of trouble, as judged from previous long experience with town gas and pressure producer gas. The suction producer is therefore that portion of the plant which required most attention. The gas is only made as required, and when working for any length of time at a particular load the conditions in the producer will adjust themselves to that load. If a sudden and considerable change of load then occurs, the producer will take a little time to adjust itself to the conditions required by the new load. The rapidity with which a suction producer will readjust itself is of considerable importance. A change from light load to full load is the most severe, because in this case the quality of the gas is poor and it is unable to give the power. In the reversed change of load the governor takes charge. Special provision has to be made for dealing with prolonged periods of light load, as, for instance, having a bye-pass through which a portion of the gas is blown to waste each stroke; otherwise there might not be sufficient suction to keep the fire alight. A special trial was framed to test the capabilities of the producers to respond to changes of load based on the light or no load trial in the regulations (No. 9).

4. *Fuel consumption.*—Owing to the conditions of running of these plants it is important to know the fuel consumption, including the amount burnt at night when the plant is standing. The general practice in the case of an engine doing constant work is to light the fire on Monday morning, bank the fire during the night, and only draw it on Saturday to clean out the producer. This practice was kept in mind when arranging the trials.

Although anthracite can be obtained in most districts it is easier to get coke, and, apart from the difficulty already mentioned in connection with tar, it will generally prove to be a cheaper fuel, notwithstanding the greater weight consumed. The coke trial was therefore of special importance.

It was borne in mind that in the case of these plants the cost of fuel is relatively far less important than in the case of a steam engine, because in the former from 1 lb. to $1\frac{1}{2}$ lb. of coal or coke is required per B.H.P.-hour, whereas in the case of non-condensing steam engines of a suitable class for "estate" engines from 5 lb. to 6 lb. are needed, and with small condensing engines about 3 lb.

The water consumption and the last three points require no comment.

These regulations seem to cover all the essential points for consideration in trials of this nature.

Historical Notes.

The combination of a gas engine with a suction gas producer is of such recent origin that a few historical notes do not appear to be out of place in this Report.[1]

Producer gas was first introduced in 1861, by Sir William Siemens, for steel melting, but only air was used, and in these circumstances at least 30 per cent. of the heat of the coal would be wasted if used in a gas engine. In 1878, Mr. Emerson Dowson applied steam as well as air; that is, he combined Siemens gas with water gas. In this way a producer gas was made which not only contained 80 to 90 per cent. of the energy in the fuel, but was more readily ignited in a gas engine owing to the free hydrogen it contained.

The first step towards a suction gas producer was made by Mons. Bénier, in Paris, in 1894, when he succeeded in utilising some of the waste heat in the producer itself to obtain the necessary steam, instead of having a separate boiler burning a considerable amount of fuel, as is necessary in the case of pressure producers. The gas engine he employed was of the

[1] These historical notes are principally taken from a paper on "Suction Gas Producers," by Mr. W. A. Tookey, before the Junior Institution of Engineers.

impulse every stroke type (Clerk type), and, in addition to the explosion cylinder, required two other cylinders. On the out stroke, one of these cylinders sucked the steam and air through the producer to make the gas, and the other cylinder sucked in air at the same time. On the return stroke the gas and air were compressed into the mixing chamber and the explosion cylinder. The engine was governed by throttling the gas admission.[1] Later on, Messrs. Taylor & Co., of Paris, improved the Bénier producer, and several Taylor-Bénier suction producer plants are still satisfactorily at work. Whilst Bénier was experimenting Messrs. Körting Bros. were doing the same thing in Germany, and they took out a patent for a suction producer, in which the air and steam were drawn through by the suction of a gas engine; but the results were so discouraging that the patent was abandoned. Then, in 1901, Messrs. Julius Pintsch, of Berlin, erected a suction gas plant near Verviers in Belgium. At first it was found impossible to start the engine, but Mr. H. Gerdes, the chief engineer to Messrs. Pintsch, after making various adjustments, had the satisfaction of getting the plant to work, and it has been in successful operation ever since. The first makers of suction producers in this country were Messrs. Crossley, in 1901.

These were the beginnings from which the present suction gas plants have been developed in so short a period of time.

Design and Construction of Suction Gas Plants.

A suction gas producer consists essentially of the following parts :—

1. A *furnace*, in the lower part of which the fuel is burnt and forms carbonic acid (CO_2), and the water vapour made in the vaporiser (see below) is broken up or dissociated into its constituents, hydrogen and oxygen. The mixture of air and steam required for the above operation is drawn in from the underside of the grate by the suction caused by the engine. In the upper layers of incandescent fuel the CO_2 is converted into carbonic oxide (CO) and the oxygen due to the decomposed water vapour is utilised to make some more CO. The temperature in the furnace gradually increases from the grate to the point at which CO begins to be formed, where it reaches about 1,800° F. From this point the temperature gradually diminishes, and the gases quit the top of the fuel in the furnace at a temperature of about 1,600° F. On leaving the producer the gas consists of a mixture of hydrogen and carbonic oxide diluted with nitrogen from the air, together with some carbonic acid which has not been converted.

[1] This information has been obtained from Mr. W. C. Horne, who was Mons. Bénier's agent in this country.

The following is an average composition when working with anthracite at full load ; at no load the proportion of combustible gases is less :—

			By volume	By weight
Combustible gases	Hydrogen	H_2	15·5	1·2
	Carbonic oxide	CO	20·8	23·5
	Methane.	CH_4	1·2	0·7
Incombustible gases	Carbonic acid	CO_2	6·5	11·5
	Nitrogen	N_2	55·5	67·0
	Oxygen	O_2	0·5	0·6

The above description of the chemical action is on broad lines only ; in reality it is very complicated.

The arrangement of the firebrick lining of producers is an important matter, as it has a considerable effect on the formation of the clinker, on the liability of the clinker to adhere, and on the ease with which the clinker can be removed. Further, if the interior is difficult to get at, the lining with firebrick is likely to be badly done by the bricklayer, and there will be defective joints which will let in air and produce intense heat in the vicinity of these joints, and thus spoil the brickwork and produce clinker. In the hoppers, by means of which the fuel is fed into the furnace, there are variations in the design of the valves which are required for connecting the hopper with the furnace and with the outside, respectively, when fresh fuel has to be put in. This detail is important, as it is essential that no air should be able to find its way into the producer viâ the hopper, and this detail has therefore received considerable attention from designers. To maintain good gas, the depth of the fuel in the furnace should not vary sensibly, and for this object it is usual to have a storage bell, which also acts as a distilling chamber, from which the volatile constituents (in the case of anthracite) are gradually given off.

2. A *vaporiser*, which may either be internal or external with reference to the shell of the furnace. The water is vaporised at atmospheric pressure by means of some of the sensible heat contained in the hot gases leaving the furnace, and in some cases by the heat of the fire. The vaporiser takes up a considerable percentage of the heat that would otherwise be wasted. In some producers definite provision is made for heating the air, and in such cases a further amount of the heat due to the combustion is saved. The heat thus recovered by the water vapour and the air constitutes the regenerative action of the suction producer.

3. The *scrubber*, in which the gas is cleaned. Just before entering the scrubber the gas pipe is generally given a sudden change of direction with the object of getting rid of the heavier particles of dust. The scrubber also acts as a cooler and

removes some of the heat due to the combustion of the fuel, this heat being the remainder of the sensible heat in the gas after vaporising the water and heating the air supply. This heat is wasted and goes away in the scrubbing water. It is essential to cool the gas before it enters the engine cylinder, in order to reduce its volume and thereby get a greater weight of gas into the cylinder, and thus as much energy per explosion as possible. A hot incoming charge would have further disadvantages as regards the running of the engine and would probably increase the liability to pre-ignition (backfiring). The scrubber is usually provided with a water seal to prevent the gas in it getting back into the furnace after stopping the engine and possibly causing an explosion. This water seal also acts as an escape valve in case of an explosion.

The scrubber was practically the same in all the producers, and consisted of a cylindrical vessel partially filled with coke, over and through which the water trickled. The water supply was effected by means of a rose or a circular pipe with holes. In the case of the Crossley producer there was a layer of sawdust on the top of the broken coke.

4. An *expansion box* to reduce the variation of the suction pressure and to give a reservoir from which the engine can draw gas, and to lengthen the duration of the suck.

The furnace proper, or generator, is much the same in all producers, the differences being principally confined to the shape and arrangement of the firebrick lining and of the details of the grate, or fuel base.

The producers are started by means of hand fans. These fans were of various makes and some of them were much easier to turn than others. This is an important detail, and ease of working will appeal to the attendant. The fans produced a pressure in the producer, and there is an advantage in this, because any leaks in the producer are at once detected by the smoke coming out. These leaks would let air in when under suction, and the efficiency would be much reduced.

To illustrate the principles on which suction gas producers are constructed, the producers shown by the National Gas Engine Co. and Messrs. Crossley Bros. will be described in detail.

Producer of the National Gas Engine Company, Ltd.

The producer of the National Gas Engine Company is shown in section in Fig. 2, and an external view is given in Fig. 3.

In Fig. 3 the generator is on the extreme left, and the scrubber in the middle; the pipes connecting the engine with the scrubber are under the floor, and the expansion box is immediately under the back end of the cylinder. The furnace is clearly shown in Fig. 2, and it will be noticed that it is of

uniform diameter; special firebricks are used, and they are separated from the casing by a thin layer of slag wool. The internal portion of the vaporiser is a ribbed casting marked A and is bolted to the furnace casing. The outside casing of the vaporiser, marked B, is also bolted to the furnace casing, but can be removed without disturbing the vaporiser. When both are removed the firebrick lining is quite easily reached, and the bricklayer should therefore have no difficulty in making good joints between the various sections of the firebrick. The cover marked C in Fig. 2 carries the distilling bell and the

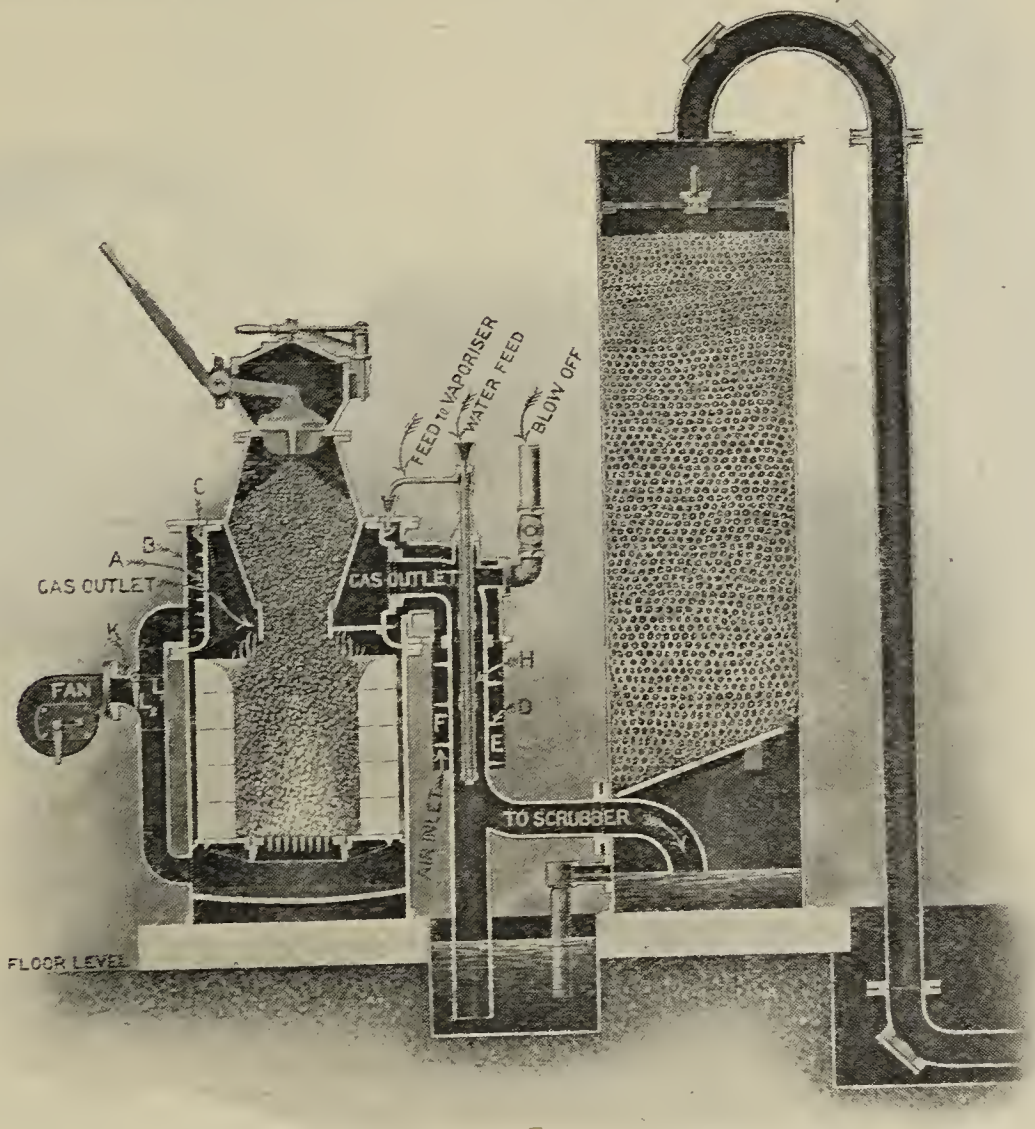

FIG. 2.—National Gas Engine Co., Ltd. Gas Producer and Scrubber.

hopper, and is secured to both A and B. By breaking this joint the condition both of the furnace and of the vaporiser can be readily examined. This arrangement of the vaporiser is well calculated for dealing with hard water. The vaporising water drips into a funnel marked "water feed," whence it is conducted into a "Field"[1] tube H, where it is heated by the hot gases, after which it is led to the "feed to vaporiser"

[1] That is, an arrangement consisting of two concentric tubes—the outer one being closed at the bottom, and the inner one discharging close to the bottom of the outer tube.

and thence to a channel surrounding the top of the vaporiser, whence it drips on to the ribs in succession and is gradually vaporised. The air inlet is marked on Fig. 2 and the air is preheated in by means of the hot gases, through the intermediary of a spiral rib EF cast on to the gas pipe, before coming in contact with the water vapour, as will readily be seen from the figure.

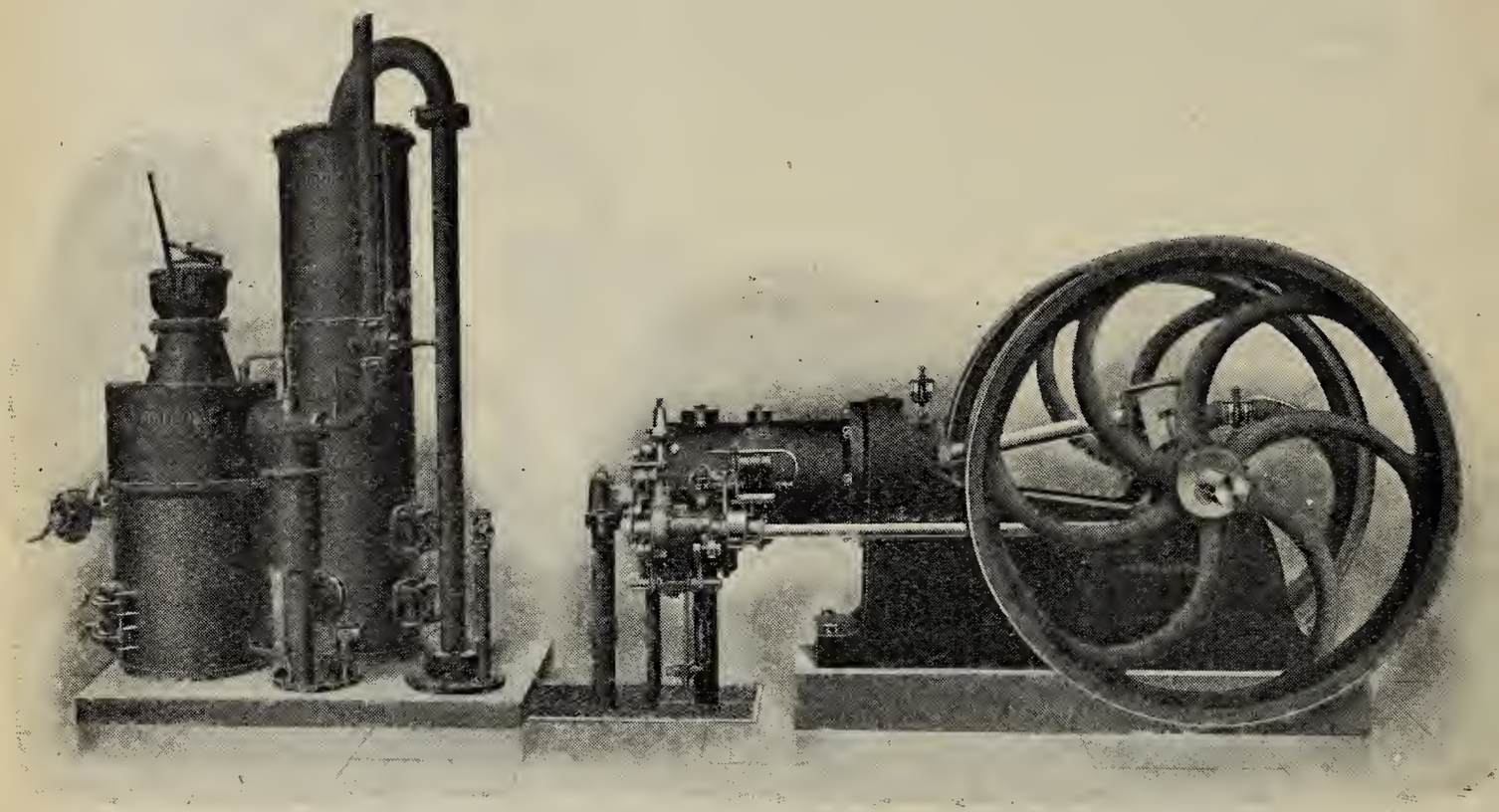

FIG. 3.—National Gas Engine Co., Ltd. General arrangement of Engine and Producer Plant.

PRODUCER OF MESSRS. CROSSLEY BROS., LTD.

The producer submitted by Messrs. Crossley Bros. is shown in Figs. 4 and 5, pp. 165 and 166.

The special feature in this producer is the disconnection between the bottom of the firebrick lining and the grate, the object of which is to minimise, if not prevent, the formation of clinker on the firebrick. The trials at Derby confirmed this contention; not a vestige of clinker was ever found on the firebrick. The tubes of square section shown in the figure are airducts and intercept the radiant heat and thus warm the air supply. It will be noticed that the firebrick lining is continued at a larger diameter above the level of the glowing fuel, and surrounds the vaporiser, which is a specially shaped steel open-mouthed vessel enclosing the lower part of the storage bell. This steel vaporiser can be easily removed for cleaning or renewal. The air inlet for what is called by the makers the "primary air," is placed on the top cover; the air is heated by contact with the hot surfaces, and after taking up moisture from the vaporiser is drawn through the square section tubes at

the grate level already referred to. In this producer there is also a "secondary dry air" supply, which, owing to a throttling action, reduces the proportion of steam as the load is reduced. A special feature of the scrubber is the layer of sawdust at the top, the object of which is to clean the gas from dust and from tar.

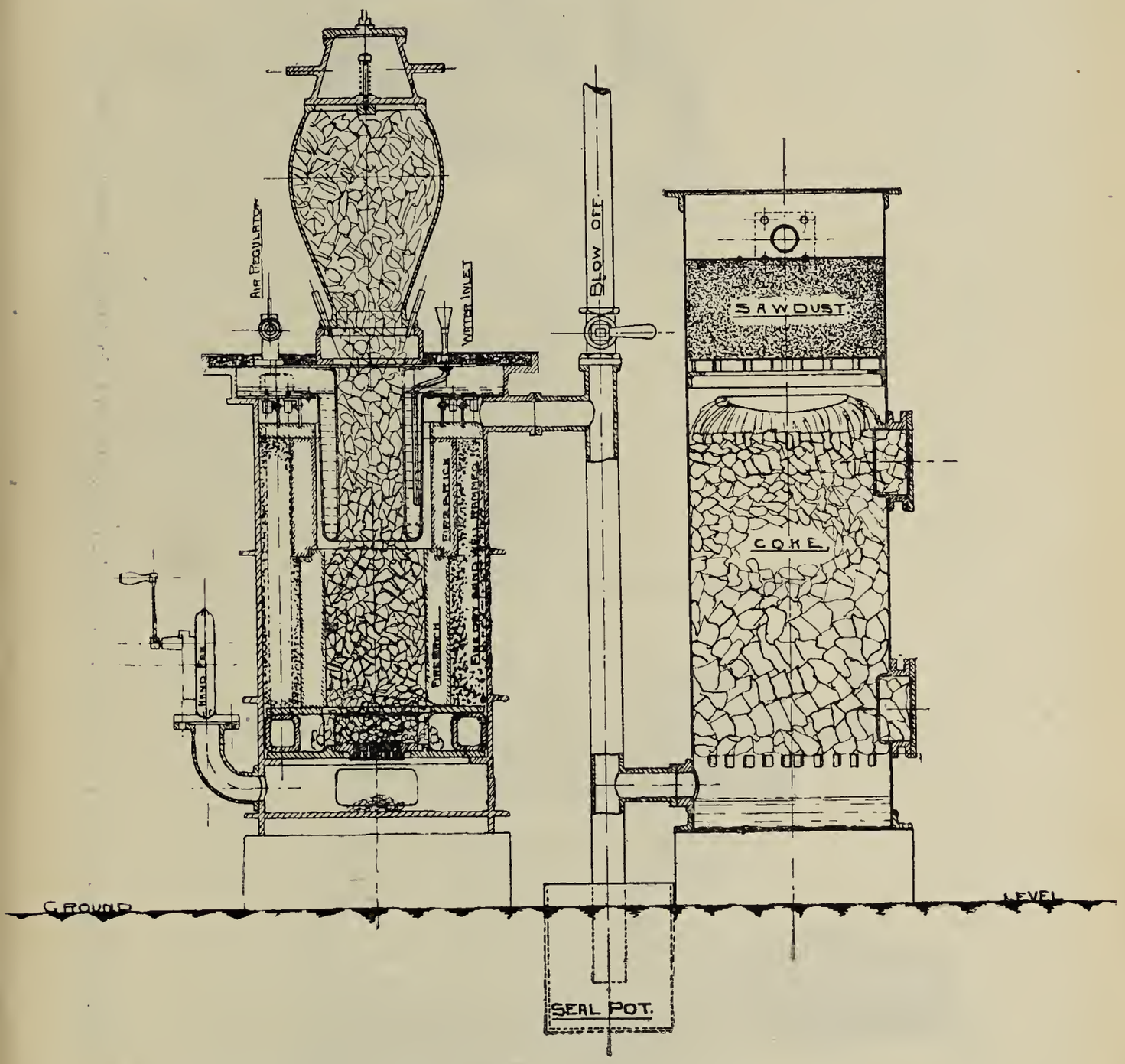

FIG. 4.—Messrs. Crossley Bros., Ltd. Gas Producer and Scrubber.

In the second plant exhibited by Messrs. Crossley the producer was the same as the one above described, with the addition of an arrangement for heating the air and the steam by means of the exhaust from the engine. Some heat is recovered in this way, but probably the greatest advantage is the improved possibility of regulating the amount of steam as may be required by variations of load. It is obvious that with such

an arrangement the amount of steam evaporated will follow closely the number of explosions, that is, will be proportional to the load ; also there will be very little lag in the adjustment

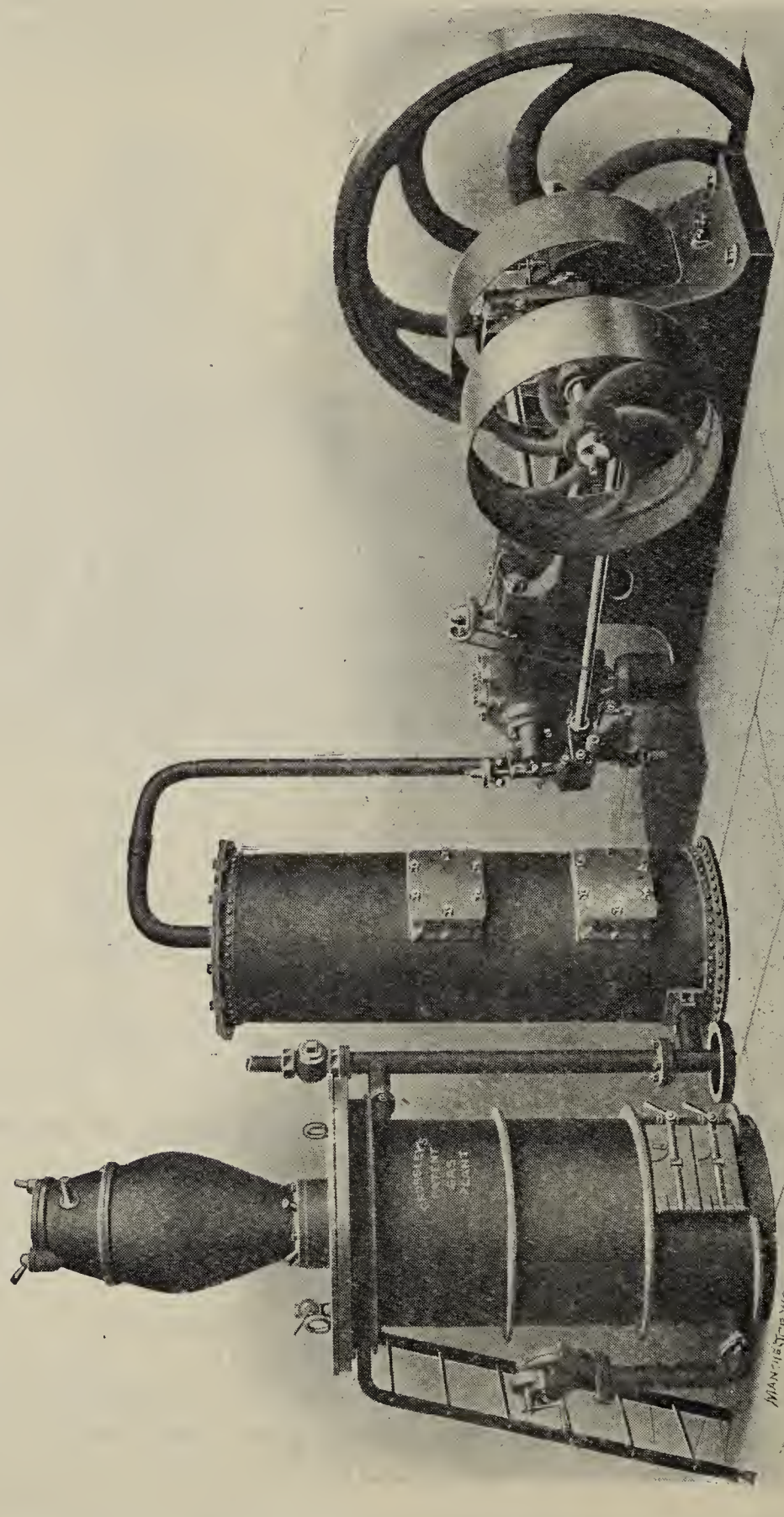

FIG. 5.—Messrs. Crossley Bros., Ltd. General arrangement of Engine and Producer Plant.

of the amount of steam. The set was, however, withdrawn from competition after running for a few hours, so this point could not be tested at the Trials.

Other Producers.

It is not proposed to describe any of the other producers, since the differences between them and the two already dealt with consist in detailed matters of arrangement.

Description of the Gas Engines used.

The gas engines used do not in reality require special description since, with the exception of two, they were of well-known types. They were in fact just the ordinary type of horizontal gas engines used with town gas or with pressure producer gas. The method of ignition was the only variant as regards the former; because producer gas is not so easily exploded as town gas, and therefore the hot tube method of ignition is not so suitable and the electric spark method is adopted. Certain of the proportions have also to be slightly modified, such as the sizes of the valves and the clearance space; the former owing to the difference in the proportion of gas to air (namely, 1 to 9 for town gas and 1 to $1\frac{1}{2}$ for producer gas); the clearance must also be reduced because a greater compression pressure is possible without risk of pre-ignition, and is also desirable in order to increase the mean pressure. Moreover, the incoming charge is at a lower pressure in the case of a suction plant, and therefore a greater ratio of compression is necessary in order to obtain the desirable compression pressure which is from 120 lb. to 150 lb. per square inch or even more. The compression ratio was measured for some of the engines, and was found to be considerably more than that usual for town gas.

The National engine.—Fig. 3, page 164, gives an outside view of this engine. The cylinder jacket is inserted into a circular bored seating in the bedplate and is bolted to a vertical circular facing, also on the bedplate. The cylinder liner is a fit in the jacket at the front end and is held up by a faced joint at the rear end, so that it is free to expand, and the jacket communicates the explosion thrust to the bed; there is a rubber ring at the front end of the jacket to prevent water leakage. The spindles of the exhaust and air valves are vertical and that of the gas valve is horizontal. All these valves can be easily dismantled by breaking three small joints. The shape of the cams driving the valves has been carefully worked out to avoid noise. The magneto is driven in a simple way by a striker on the 2 to 1 shaft, and there is a freewheel arrangement to prevent catching if the engine should reverse; this freewheel also contains a device for retarding the spark by a definite amount for starting, which device is released by a trigger so soon as the engine is running. The connecting rod

is of the marine type at *both* ends and is a very substantial piece of work. The lubrication of the main bearings is effected by means of rings and that of the big end by means of the usual centrifugal pipe. The piston is lubricated by a drip sight feed and there are special grooves on the piston to prevent the oil being blown away in the event of the piston rings leaking. The governing is of the usual hit-and-miss type.

The Crossley engine.—This engine is shown in Fig. 5, page 166, and is very similar in design to the National engine. The arrangement of the magneto is somewhat different, but is equally simple. The spark can be retarded by a definite amount for starting. The connecting rod is of the marine type at the big end and of the locomotive type at the small end.

Description of the Trials.

The trials were started at 9 a.m., on Monday, June 18, and began with the full load trials using anthracite as a fuel. The producers were empty and the time of starting each engine and of getting on the full load, from the moment of laying the fire, was noted. The various plants were started at intervals, and each was run for nine hours on full load and then stopped. The hopper and the fire doors of every producer were then sealed up. The last engine was stopped at about 7 p.m. During the night the fires were banked, and on :

Tuesday, June 19, at 9 a.m., the first plant started on Monday was got under way and the time required before the engine could be started and the full load put on was noted. The other plants were successively started in the same manner, so that in each case the fires were banked for approximately fourteen hours. The full load was maintained for five hours, after which the engines were stopped, the fires drawn, and the partially consumed fuel placed in iron vessels for weighing and examination.

This completed the full load anthracite trials which consisted of nine hours full load, fourteen hours banked fires, and five hours full load.

Wednesday, June 20.—The half load anthracite trial was carried out this day; the starting of the plants from laying the fire was a repetition of the trials carried out on Monday. Each engine ran for nine hours on half load when the engine was stopped, the fire drawn, and the fuel placed in iron vessels for weighing and examination as before.

Thursday, June 21.—The variable load trial was made on this day; the first plant was started at 9 a.m., and the others were started in succession at short intervals. Each engine was run for two hours with no load from the time of starting. Then full load was quickly put on and maintained for one

hour, when the load was taken off and the engine was run for one hour with no load. Then one-third load was suddenly put on and maintained for one hour, when the load was increased to half load, which was kept on for one hour, when full load was put on and maintained for one hour. The fuel used was anthracite, but no measurement of the amount used was made.

Friday, June 22.—The full load coke trial was made on this day and the first engine was started at 9 a.m. The time required to start the engine and get on full load was noted, after which each engine was run for nine hours on full load. On stopping the engine the fire was drawn and the unburnt fuel placed in iron vessels for weighing and examination.

Saturday, June 23.—A "novice" trial was made with three of the engines, namely, the National, the Campbell "hit-and-miss," and the 15 H.P. Crossley. The producers were got ready by each competitor to supply gas; but the engine was twice started and the load put on by the observer who had had charge of the log sheet for that particular engine. Not the slightest difficulty was experienced in thus starting any of these engines.

Measurements and Observations.

The following is a description of some of the principal measurements and observations that were taken.

Measurement of water used.—The water used by the scrubber and the vaporiser was measured by means of water meters lent by Messrs. Beck & Co., Ltd., which were of the positive type (Schonheyder's patent), and a testing cock was placed on the delivery side. All the meters were carefully calibrated and found to be correct previous to the trials, and certain of them were again calibrated after the trials and were still correct.

Indicator diagrams and the measurement of the I.H.P.—Indicator diagrams were taken at intervals and were studied as regards the initial and compression pressures, &c., but as no great reliance can be placed on indicator diagrams taken from gas engines as regards measurement of power[1] the I.H.P. was not determined and hence the brake efficiency, that is, the ratio of the B.H.P. to the I.H.P., was not obtained. Even if reliable diagrams could have been obtained the staff of observers was insufficient to take the necessary number of diagrams from each engine. Moreover, the indicator gear fitted to some of the engines consisted merely of a pin fixed to the end of the crank shaft and rotating with it. As is well

[1] This conclusion was come to by the Committee of the Institution of Civil Engineers on Internal Combustion Engines (see pp. 247 and 268, Min. Proc. Inst. C.E., Vol. CLXIII.

known such an arrangement cannot give a true indicator diagram, and at any rate is quite useless as regards obtaining the I.H.P. Many of the gears were insufficiently stiff, and errors were imported thereby. A certain number of light spring cards were also taken and gave useful information with regard to the running of the engines. A number of diagrams were taken with the Mathot indicator, which is shown in Fig. 8, and some extremely interesting results were obtained which will subsequently be referred to.

Revolutions.—The total revolutions for each test were obtained by means of revolution counters. Readings were taken of these counters at intervals, from which the revolutions

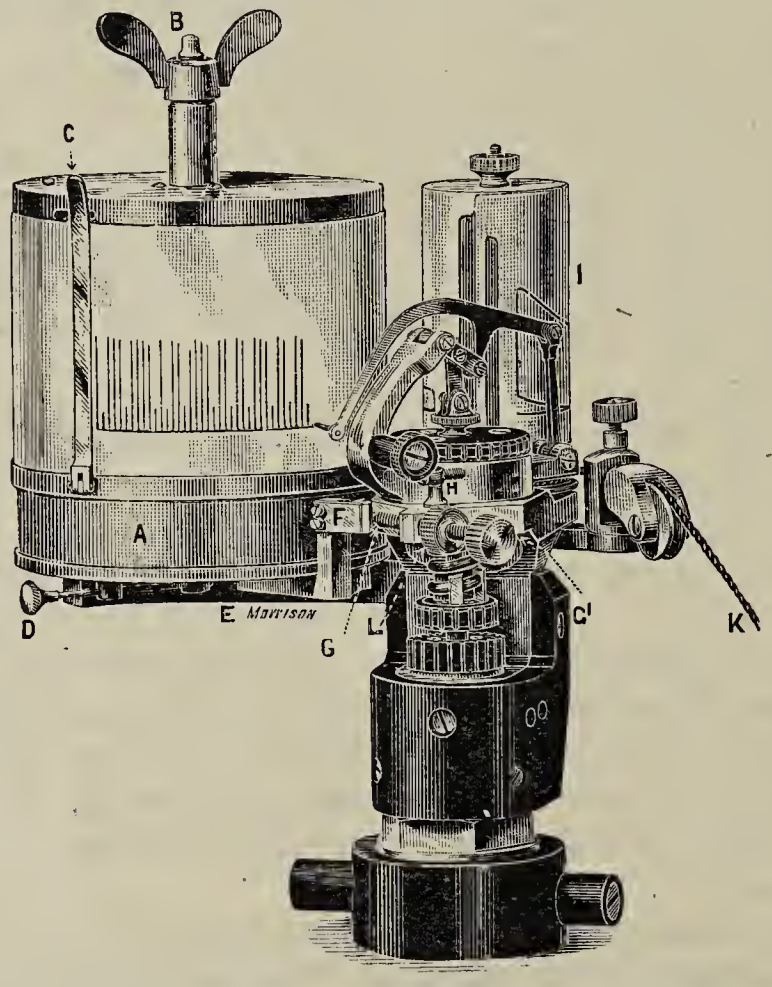

FIG. 8.—Mathot Indicator and Recorder.

per minute could be deduced. These observations are, however, difficult to take, and in many cases the result was unsatisfactory; there were apparent fluctuations of speed which certainly did not exist. These counters, however, gave the correct mean speed when taken over a long interval of time.

Explosions per minute.—The total number of explosions during each test was recorded by a counter. Several of these counters gave much trouble and were quite unreliable. Readings at intervals were also taken to obtain the explosions per minute to see if any variation took place during the progress of the trial; these readings, however, are subject to the same errors as noted above in connection with revolution counters.

Messrs. Heyward and Marshall took check readings of both revolutions and explosions per minute.

Producer gas.—No attempt was made to obtain either the composition or the temperature of the producer gases. A largely increased staff would have been needed for making such observations.

Time required to start.—The time required to start the plant is of some importance, and it is necessary to distinguish between starting with an empty producer, and with one in which the fire has been banked. The former was tried on Monday, June 18, and again on the Wednesday, and the latter on the Tuesday. As regards the producer the time of starting should undoubtedly be reckoned as the time required for producing good gas from the moment of lighting up, or from starting blowing in the case of banked fires. The gas could have been tested by lighting it and observing the colour of the flame, but the most reliable test is whether the gas is capable of running the engine with a load ; therefore the time required before the load could be put on was the fairest guide. The skill and temperament of the attendant in judging of the quality of the gas is, however, an important factor, and thus a plant which can be quickly started may lose time owing to the attendant thinking that the gas is good before it is, leading to a false start. It was in fact noted that some of the attendants in their anxiety to make a quick start did so before the gas was good, with the consequence of making a false start and delaying matters.

On the other hand the attendant may not have started the engine as soon as he might have done. In both cases the starting time is longer than necessary. Too much stress should not therefore be laid on these competitive starting times. Moreover, unfortunately, on Monday some of the kindling wood was damp, and this caused delay in getting some of the fires lighted. A few of the competitors had taken the wise precaution to dry their wood, but in the case of the National plant the wood could not be lighted without the use of a little paraffin oil, and in both Messrs. Crossley's plants, after vain attempts, the fire had to be drawn and a fresh start made with a new supply of kindling wood. On Monday and Tuesday some of the competitors, in order to reduce the time of starting, opened vent pipes in a manner which should not occur in actual use, owing to the possibility of poisoning by carbonic oxide. On Wednesday this was not permitted, and in some cases a marked increase in the time required to start was observed. At the coke trial on Thursday there was no competition as regards the time of starting, and a considerable increase was noticeable, due no doubt in some measure to the greater difficulty in getting

coke to burn and also because, just at first, there is a difficulty in obtaining a sufficiently inflammable gas (hydrogen).[1] These times may be regarded as those likely to obtain in actual practical use with coke.

Smoothness of running.—An estimate was made of the comparative smoothness of running, by carefully listening to the running of each engine, and by feeling the bearings to notice if there was any undue knock. The smoothness of running of the valves was also noted. The bearings were examined on several occasions after the engines were stopped. They were invariably quite cold. An exception, however, must be made in the case of the Hindley engine, which was running in a closed crank chamber, so that the bearings, and in fact all the working parts, were heated by conduction from the cylinders ; the bearings were, however, not unduly warm. The bearings of the Newton engine, which was also enclosed, were not examined.

Ashes produced.—In some cases the ashes were more or less separate from the coal or coke raked out of the producer at the end of the run and could be weighed. In other cases they were so mixed up with the fuel as to render any separation practically hopeless. The matter was not one of great moment, however, as the amount of ashes depends more on the fuel than on the producer. In this connection a great difference was noted as regards the appearance of the fuel that came out of the various producers at the end of a run ; in some cases it appeared as if it had never been used, in others it looked more like cinders full of ashes. This may, however, be in great part due to the manner in which the various attendants fed in the fuel towards the end of the run ; that is, the final condition of the fire and fuel may not have been that obtaining during the whole of the trial.

Clinker.—The quantity and nature of the clinker produced was specially observed, because the satisfactory continuous running of suction gas plants depends not only on the amount of the clinker, but whether it adheres to the firebrick lining or not, and whether it comes away easily when raking out the ashes, that is, whether the clinker is friable or vitreous. As regards the design of the producer, the points noticed in this connection were : the manner of supplying water to the vaporiser (since the clinker depends on the steam), and the shape of the bottom of the furnace and of the grate. An estimate of the amount of clinker adhering to the firebrick lining was also made.

[1] With anthracite there is a small proportion of volatile hydrocarbons which are distilled from the fresh coal and give the inflammable gas required for starting.

Clinkering whilst running.—Better provision was made for this operation in some of the producers than in others as regards the arrangements of the doors, and such producers are obviously better suited for continuous running and for working with inferior fuels. If the ash door is opened for clinkering whilst running, an undue amount of dry air enters the furnace, that is to say, there is insufficient steam. In the Mersey producer a water tap was fitted which could be utilised for temporarily increasing the amount of steam when clinkering. A can of water emptied on the grate practically answers the same purpose.

Chances of explosion.—A careful examination showed that, except from carelessness on the part of the attendant, the chances of a harmful explosion are practically nil. To cause an explosion it would be necessary for the attendant to open the feeding door to the hopper at the same time as the valve communicating from the hopper to the furnace. In the case of the Mersey producer, the hopper was so arranged that such a through communication is impossible. A similar provision might be adopted with advantage in other cases. A slight explosion occurred on starting the National engine on Monday, June 18, when opening the firedoor, and in another case there was a slight explosion and flame when "blowing up" the producer. As already pointed out, the water seal of the scrubber prevents gas getting back and acts as a safety valve.

Chances of poisoning.—Since the gas produced contains a large amount of carbonic oxide, which is of a very poisonous nature, and being inodorous may easily escape detection, the chances of poisoning were carefully considered. When the engine is working the pressure in the producer is below that of the atmosphere, and therefore any leakage would be *into* the producer. It is therefore when the producer is being started, or opened up after running, that there is any real danger of poisoning; but an accident could only happen through gross carelessness. When the producer is being started there is a pressure in it due to the fan; and to reduce the effort of blowing, and get rid of the air in the pipes, &c., a large vent pipe is opened by means of a valve. The outlet of this pipe should be carried outside the building where the discharge of gas can do no harm. A small cock has to be opened to test the gas at starting, and the arrangement of this cock was better in some of the plants than in others.

Fire risk.—There did not appear to be any serious fire risk with any of these suction producers; no more in fact than there would be with a slow combustion stove.

General reliability.—The duration of the trials was too short to admit of the trials themselves discriminating between a great many of the plants in this respect. The matter had

therefore to be decided as a matter of judgment based on the design of the various plants. There was no difficulty as regards the engines themselves, for the reliability of the usual design is undoubtedly as great as that of any ordinary piece of mechanism; and with due care, especially as regards the cleaning of the valves, it is certainly on a par with that of the steam engine of the same size. Attention was paid to the arrangement of the exhaust valve springs and to the air and gas valve springs. As already pointed out the springs used in the magneto gear are of necessity somewhat delicate, and the provisions made in this respect in the case of some of the engines were far better than in others. The producers are more likely to give trouble than the engines, and the arrangements for regulating the air and the water supply were specially considered, as well as those for minimising clinkering and its bad effects.

Lubrication.—The lubrication of the crankshaft bearings was in most cases effected by ordinary drip sight-feed lubricators. In a few cases, however, ring lubrication had been applied, a very obvious improvement, as this method gives a better and more copious lubrication and is not affected by forgetfulness on the part of the attendant. The cylinder and piston were lubricated in general by means of a drip sight-feed lubricator, the oil being suitably conducted on to the piston body. Sometimes, instead of a sight-feed, a rotating pin, dipping into an oil reservoir and carrying up a drop of oil with it each time, was used. There is an objection to this latter arrangement for, as the level of oil in the reservoir falls, so the size of the drop carried by the pin becomes smaller, and the amount of lubrication diminishes. To obviate this difficulty a duplex pin lubricator was fitted to the Davey-Paxman engine; the pin dips into a small reservoir which is overfed by another revolving pin from the main reservoir so that a certain portion of the oil flows back, and the small reservoir is always kept full. A drip feed lubricator has however the objection that should there be a leak past the piston rings the oil will be held back in the supply pipe and the lubrication may fail. In the National engine this difficulty is got over in an ingenious manner; the pressure in the cylinder at the end of the stroke is utilised to force the oil into a groove around the cylinder. In the Campbell and in the Dudbridge engines the difficulty is got over by using a force pump, but in both cases additional mechanism is required.

From these trials it can be deduced that the following fuel and water consumptions may be expected with a good suction producer plant, when working continuously at the loads specified and under the best conditions :—

Anthracite.

Full load: 1·1 lb. per B.H.P. hour, including fuel needed for starting and for banking during the night.

Half load: 1·6 lb. per B.H.P. hour, including coal for starting.

Water: 1 gallon per B.H.P. hour at full load and $\frac{3}{4}$ gallon at half load.

Coke.

Full load: 1·3 lb. per B.H.P. hour, including fuel needed for starting.

Water : $1\frac{1}{2}$ gallons per B.H.P. hour at full load.

The following deduction can also be made from these trials :—

"Assuming a 20-brake-horse-power plant to start on Monday morning with an empty producer, and to run ten hours per day on full load for a week, banking the fires at night, the consumption of anthracite peas would be about half a ton for the week, and about three-eighths of a ton if the average load is about half full load. With coke the consumption is about 25 per cent. more. From 2,000 to 3,000 gallons of water per week are required for a 20-brake-horse-power plant to provide water for the scrubber and the producer, and of this by far the larger part would be used in the scrubber."[1]

Figs. 9 to 25, pp. 177 to 182, are photographic reproductions of certain indicator and Mathot diagrams selected from the large number that were taken during the trials.

Fig. 9 was taken from the National engine, when running at full load, and requires no comment; it is just a good ordinary indicator card.

Fig. 10 is the Mathot card for the same engine also taken at full load, and each of the vertical lines (except the very short ones) corresponds to an indicator diagram like Fig. 9, and the height of these lines corresponds to the maximum pressure of the indicator diagram. As both diagrams were taken with the same spring, $\frac{1}{300}$ (that is, 1 in. represents 300 lb. per square inch), it will be seen that the full line in Fig. 9 corresponds to a line of average height in Fig. 10, the top dotted line to one of the longer lines, and the lower dotted line to one of the shorter lines in Fig. 10. It will be noticed that the area of the indicator card is not substantially altered by the amount of the maximum pressure, and this fact must be borne in mind when studying the Mathot diagram; that is, the mean pressure of each diagram is by no means proportionate to the height of the lines on the Mathot diagram. The very short lines on the Mathot diagram show the compression reached when the gas valve is shut, that is, before a "miss" stroke; and this compression pressure is less than that reached before an explosion stroke.

[1] "Suction Gas Plants." Paper read by Professor W. E. Dalby, M.A., B.Sc., before the British Association, August, 1906.

The reason is that, when the gas valve is shut, only air is drawn in during the suction stroke ; and, owing to the throttling action of the air inlet valve, the compression begins at from 1 lb to 4 lb. per square inch below atmospheric pressure. This action is well shown in Fig. 25 and again in Fig. 11 where the two compression lines are clearly indicated ; in the latter case the throttling action of the air valve was considerable.

It will be noticed in Fig. 10 that the maximum pressure after a miss is generally less than at other times ; this effect was observed in all the other engines with the exception of the Railway and General engine, but more especially of the Dudbridge engine in which there was a great increase in maximum pressure (from 360 lb. to 490 lb. per square inch) after each miss.

Fig. 12 is an ordinary indicator diagram taken with a weak (or "light") spring ($\frac{1}{12}$) and shows the suction line previous to an explosion, that is, when both air and gas valves are open. It will be noticed that the pressure in the cylinder just before the beginning of compression is very little less than atmosphere, so that a full weight of charge is obtained. Fig. 13 is the Mathot diagram for the National engine at half load and Fig. 14 is a diagram of the same engine at no load after running for some considerable time in this way. Fig. 15 is also a no load Mathot diagram of the same engine, but was taken a few minutes after the change from full load to no load was made. The very high maximum pressure observed is due to the richness of the gas obtained under these conditions : the effect, however, only lasted for a few minutes. Mathot cards taken on changing from full load to no load with the Crossley, Railway and General, Fielding, and Kynoch engines gave precisely the same effect.

Fig. 16 is an ordinary indicator card from the National engine when working at full load with coke, and Fig. 17 is the corresponding Mathot card. No great difference is observable between Figs. 17 and 10 ; with most of the other plants, however, considerably less pressure was obtained with coke than with anthracite.

Figs. 18 to 25 are diagrams for the Crossley engine taken under similar conditions to those just described for the National engine. In Fig. 19 the drum working the Mathot indicator was set to run faster ; hence the closeness of the lines. The higher maximum pressure obtained in the Crossley engine is due to the higher ratio of compression. Comparing Figs. 24 and 19 it will be seen that in the case of this engine the maximum pressure reached with coke is less than that obtained with anthracite. Fig. 25 is a weak spring diagram and gives the suction and compression lines both for a "hit" and for a "miss" stroke ; the throttling action of the air valve when

[Text continued at page 183.]

Reduced reproductions of Indicator diagrams and Mathot diagrams. (Reduced in the proportion of 4 to 3 approx.)

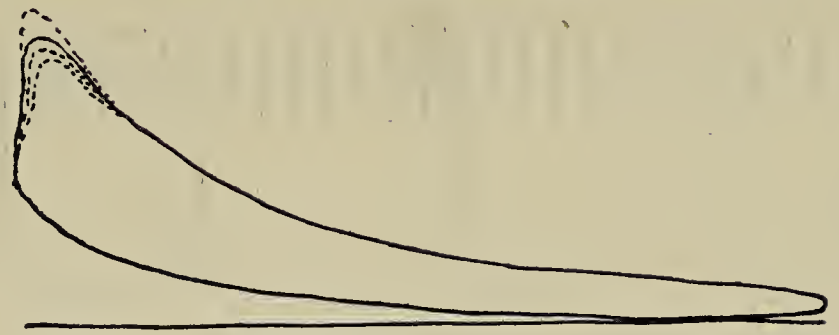

FIG. 9.—National. 19-6-06. Full load anthracite. 85 hits. Spring $\frac{1}{300}$.

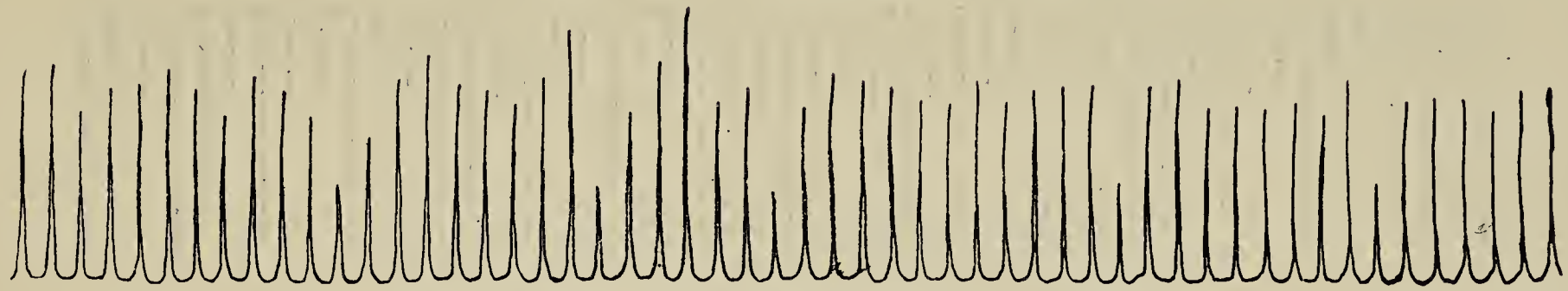

FIG. 10.—National. 19-6-06. Full load anthracite. Spring $\frac{1}{300}$.

FIG. 11.—Fielding. 19-6-06. Full load anthracite. 81 hits. Spring $\frac{1}{300}$.

FIG. 12.—National. 19-6-06. Full load anthracite. Weak spring diagram. Spring $\frac{1}{12}$.

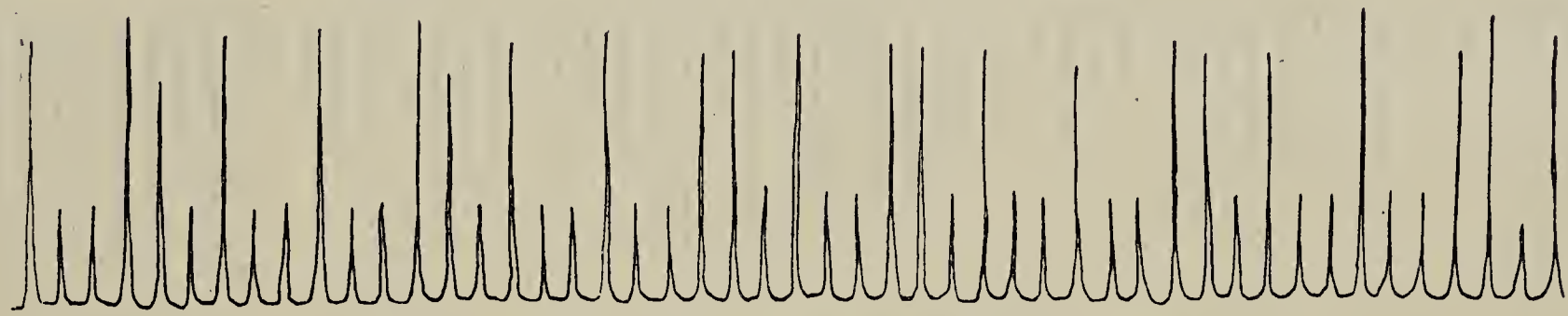

FIG. 13.—National. 20-6-06. Half load anthracite. Spring $\frac{1}{300}$.

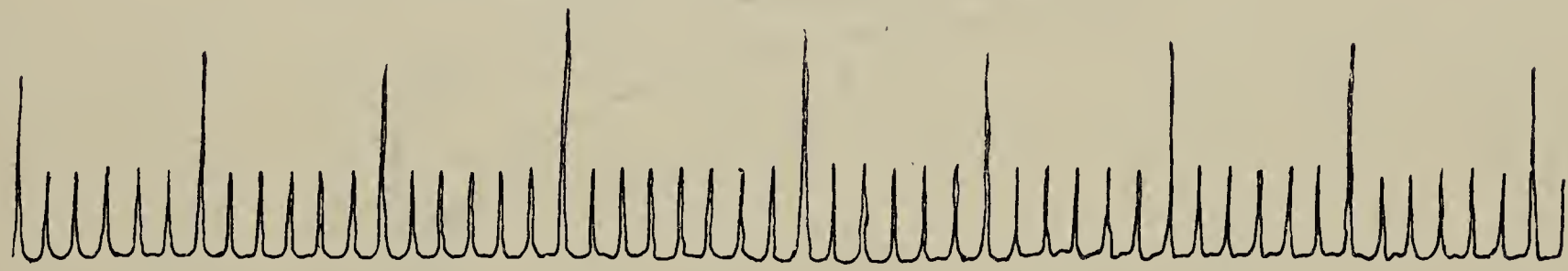

FIG. 14.—National. 21-6-06. No load anthracite. Spring $\frac{1}{300}$.

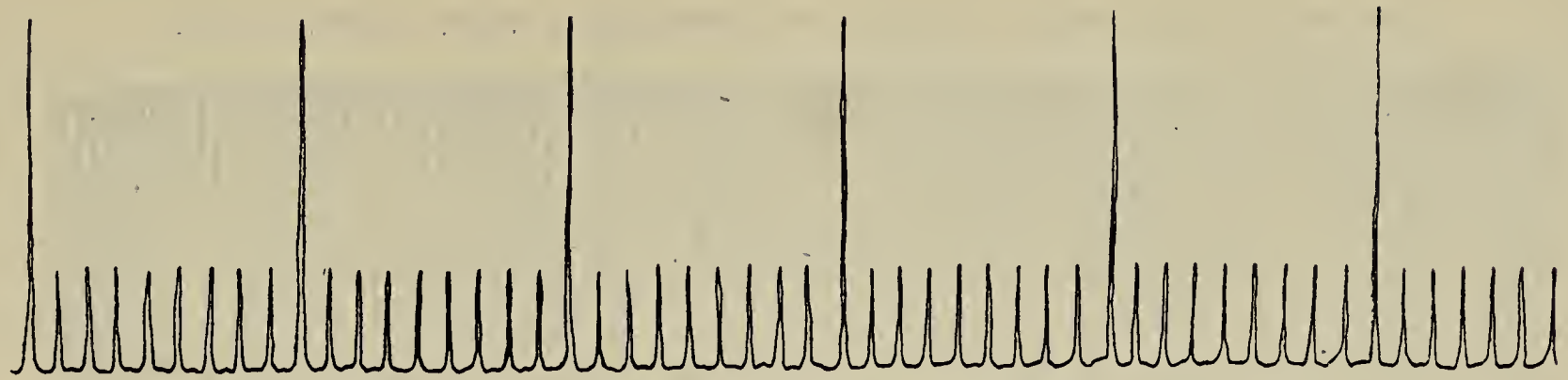

FIG. 15.—National. 21-6-06. Anthracite. After changing from full to no load. Spring $\frac{1}{300}$.

FIG. 16.—National. 22-6-06. Full load coke. 190·8 revs. 81·5 hits. Spring $\frac{1}{300}$.

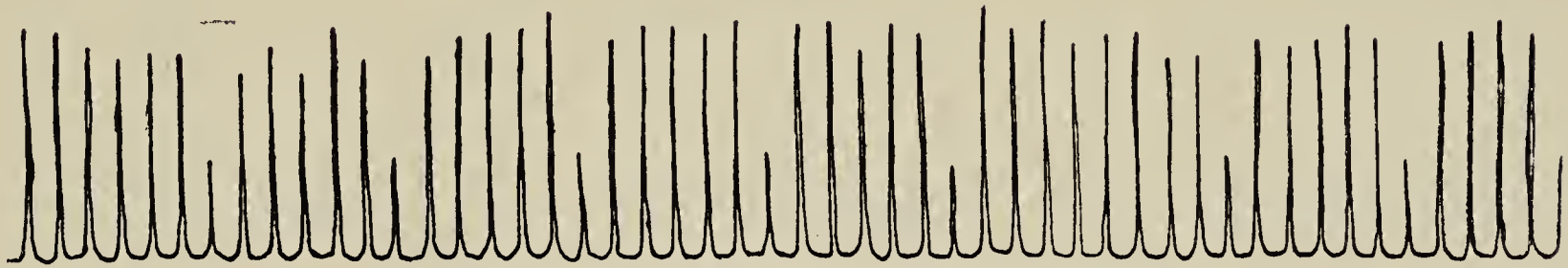

FIG. 17.—National. 22-6-06. Full load coke. Spring $\frac{1}{300}$.

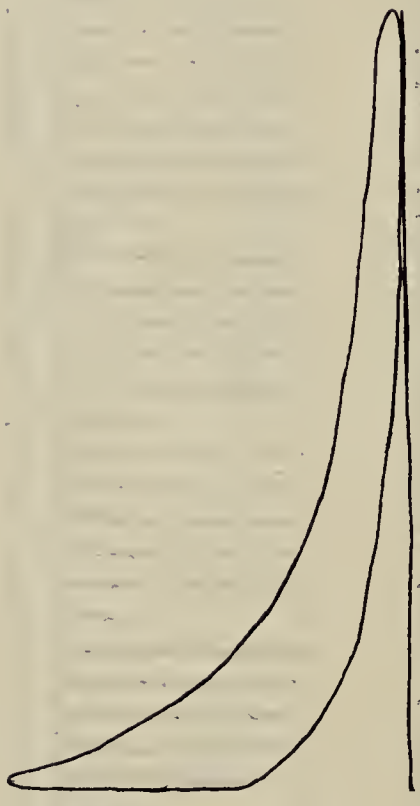

FIG. 18.—Crossley. 18-6-06. Full load anthracite. Spring $\frac{1}{300}$.

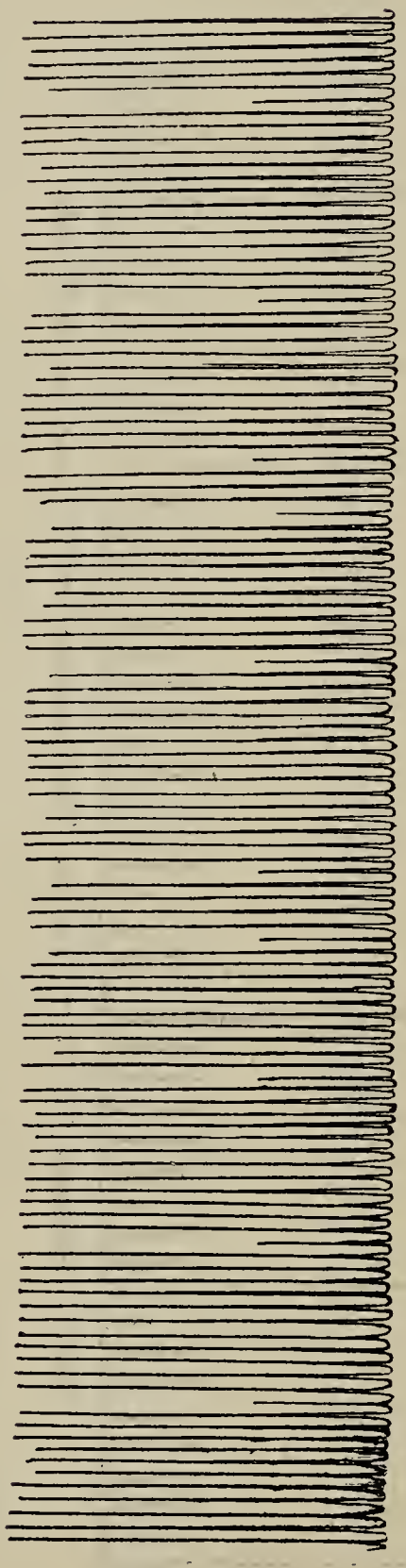

FIG. 19.—Crossley. 18-6-06. Full load anthracite. Spring $\frac{1}{300}$. (Mathot drum at higher speed.)

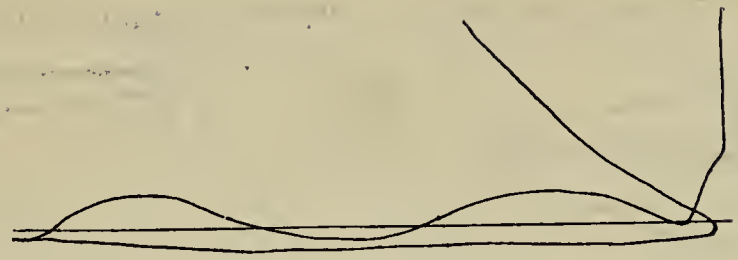

FIG. 20.—Crossley. 18-6-06. Full load anthracite. Weak spring diagram. Spring $\frac{1}{12}$.

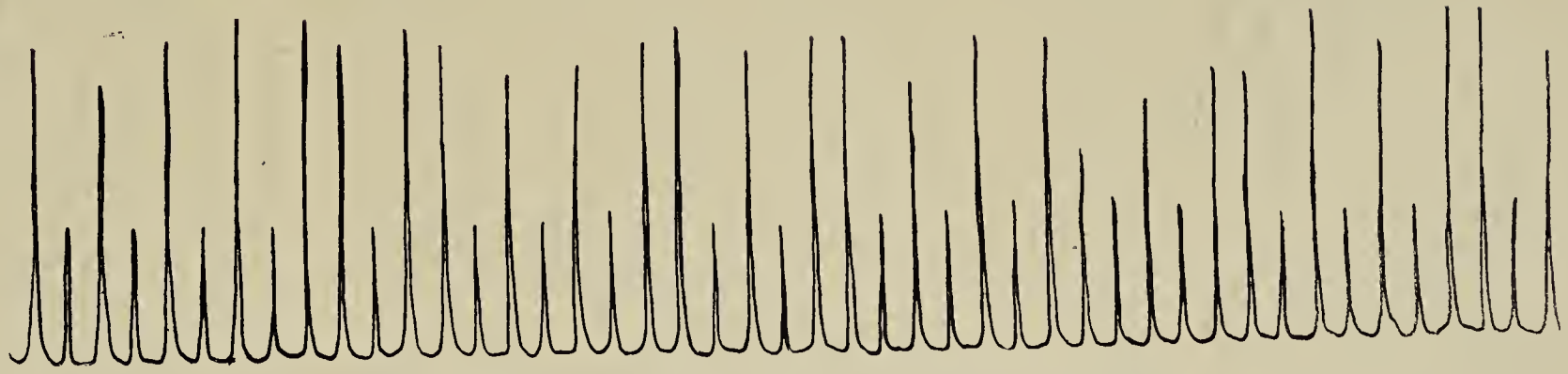

FIG. 21.—Crossley. 20-6-06. Half load anthracite. Spring $\frac{1}{300}$.

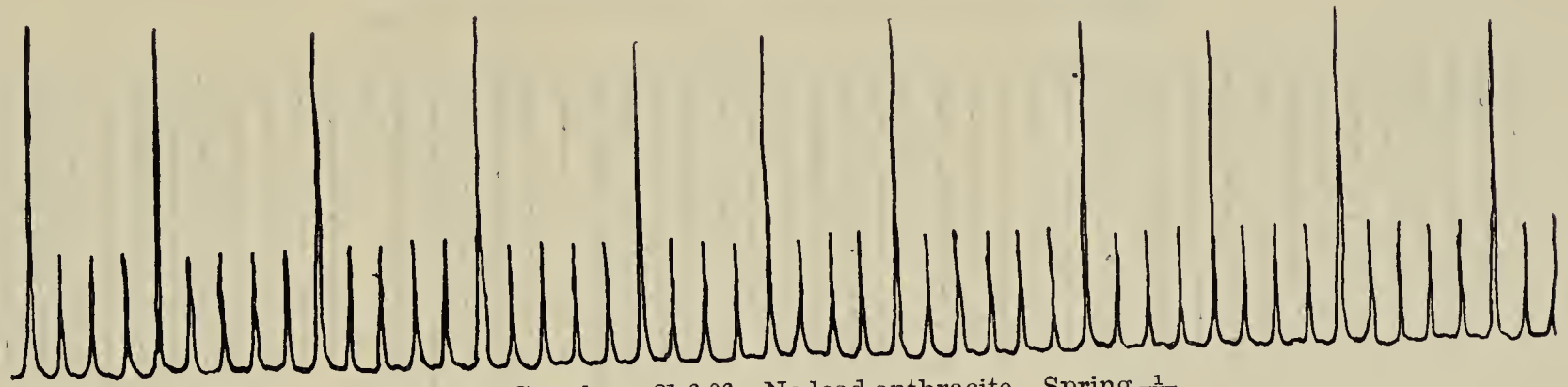

FIG. 22.—Crossley. 21-6-06. No load anthracite. Spring $\frac{1}{300}$.

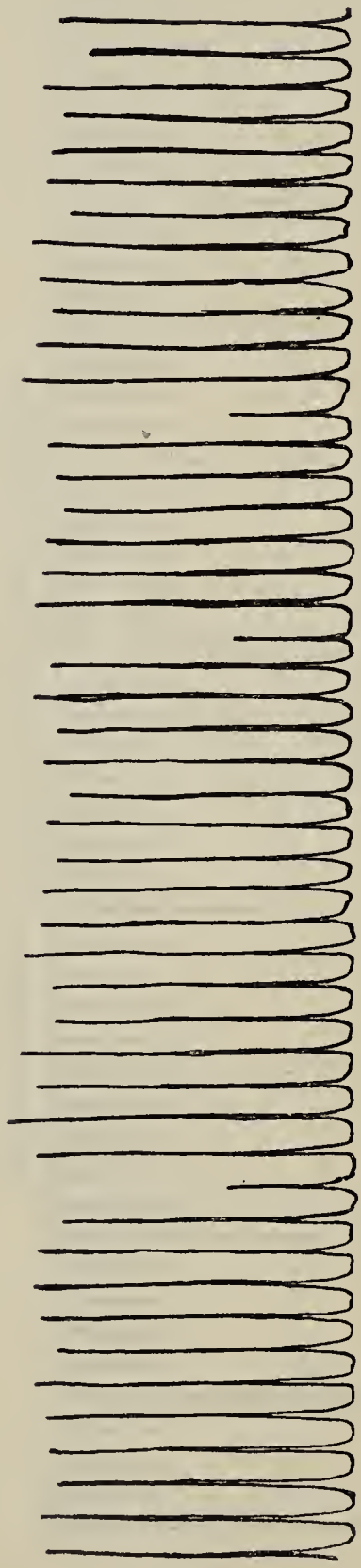

FIG. 24.—Crossley. 22-6-06. Full load coke fuel. Spring $\frac{1}{300}$.

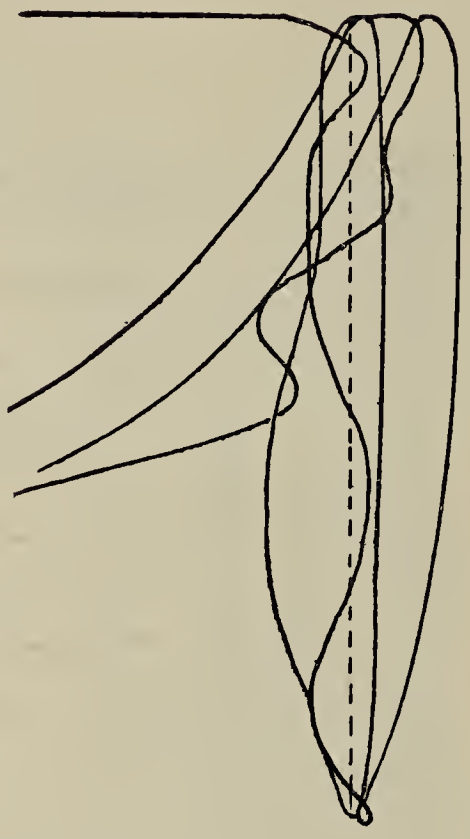

FIG. 25.—Crossley. 22-6-06. 10.20. Full load coke. Spring $\frac{1}{12}$.

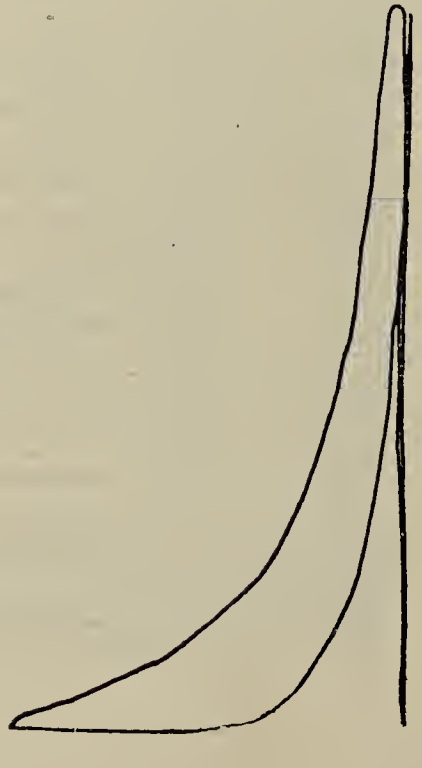

FIG. 23.—Crossley. 22-6-06. Full load coke. 183 revs. 80 hits. Spring $\frac{1}{300}$.

[Text continued from page 176.]
alone open is very noticeable, as are also the two compression lines.

An interesting set of Mathot diagrams was obtained from the National and from the Campbell "hit-and-miss" engine whilst the engines were starting. The first few explosion strokes showed gas of good quality, but soon the maximum pressure dropped to a very low figure showing poor gas. This effect lasted for about one minute and a half when the gas began to improve in quality, and in three minutes from the start it was satisfactory and the full maximum pressure required was obtained. A Mathot card taken from the Davey-Paxman engine showed very clearly the effect of altering the timing of the ignition, which could readily be done with the timing arrangement fitted to this engine.

There is no doubt that the Mathot diagrams are invaluable in the case of gas engines, as they enable the Engineer to feel, so to speak, the pulse of the engine.

Award of the Judges.

After full consideration of the observations recorded the Judges arrived at the conclusion that the two plants which most satisfactorily fulfilled the regulations and commended themselves most for general purposes were the 20 B.H.P. plant exhibited by the National Gas Engine Company, Ltd., and the 15 B.H.P. plant exhibited by Messrs. Crossley Bros., Ltd.

In order to discriminate between these two, a detailed examination was made of forty items, each of which was separately considered and marked, with the final result that the following award was made :—

Gold Medal to the National Gas Engine Company, Ltd., Wellington Works, Ashton-under-Lyne, for their 20 B.H.P. National Gas Engine, with 20 B.H.P. National Suction Gas Plant. Catalogue, No. 7.

Silver Medal to Messrs. Crossley, Bros., Ltd., Openshaw, Manchester, for their 15 B.H.P. gas engine and 15 B.H.P. Suction Gas Producer. Catalogue, No. 31.

General Conclusions.

It is evident from the results of the trials, that many of the suction gas producer plants submitted for trial were quite satisfactory. There can be no reasonable doubt that with due care any of them would give satisfaction if employed for agricultural work as an "estate" engine. Although, however, less manual labour is required than in the case of a steam engine, more intelligent care is necessary to ensure the production of gas of good quality.

The economy trials confirm the results that have been previously obtained elsewhere, when the fuel required for banking and starting is taken into account. As regards the

attendance, it is less than would be necessary for a steam engine and boiler, and not sensibly greater than what is needed by an oil engine of the same power under like circumstances. It may be said that, as regards reliability, the duration of the trials was insufficient to warrant a definite opinion; and undoubtedly only actual experience can show to what extent "clinkering" and "staging" of the fuel may be sources of trouble in the conditions under which suction gas plants may have to run for agricultural purposes. It is interesting to note in this connection that the Dowson producer, working in conjunction with the Railway and General Engineering Company's engine, had been in use continuously for three months prior to the trials, and it was found, on close examination, that the condition of the furnace was quite satisfactory, and the amount of clinker firmly adhering to the firebrick lining was very little. It is generally supposed that the firebrick lining in a well-designed producer, that is, one in which the steam supply is properly regulated, ought to last about two years. The expense of replacing the firebrick at such intervals cannot be regarded as a serious item of expense.

It is probable that suction gas plants will be able to replace portable steam engines for many purposes with distinct advantages both as regards handiness and economy.

A further step in advance will be made when a traction suction gas plant has been placed on the market. Another desideratum is a suction producer which will deal satisfactorily with bituminous coal. It is understood that several firms are experimenting with such plants, that successful results have been obtained already, and that at no distant date it may be possible to hold competitive trials.

In conclusion, the Judges desire to express their approval of the arrangements made by the Consulting Engineer of the Society and his Staff for carrying out the trials. They also fully appreciate the readiness with which the exhibitors gave them information.

H. Riall Sankey.

25 Victoria Street,
Westminster, S.W.

MISCELLANEOUS IMPLEMENTS EXHIBITED AT DERBY, 1906.

THERE was an increase in the number of exhibits in the Implement Yard this year, the number being 4,772 as against 3,845 in the previous year. The number of the Miscellaneous Implements entered for the Society's Silver Medal also showed a slight increase, the figures being 56 as against 54 in 1905. The Judges recommended the award of Silver Medals to Articles Nos. 105 and 1274. The following are the particulars of the awards :—

AWARDS OF SILVER MEDALS.

No. in Catalogue	Exhibitors	Nature of Implement
105	Messrs. H. P. SAUNDERSON & Co., LTD., Elstow Works, Bedford.	Motor.
1274	Messrs. WM. EDDINGTON & Co., Plaistow, London, E.	Section Remover.

Article 105.—"Universal Motor, 30 B.H.P., new model, with combinations. New carburettor to burn petroleum,

FIG. 1.—The Universal Motor, as attached to a three-furrow plough.

petrol, or alcohol, mounted high on springs, with three speeds forward, and reverse. Combinations:—(1) As a three-wheeled agricultural tractor, all three wheels propelling for hauling and driving machinery (will haul and work a threshing drum). (2) As an ordinary motor lorry to carry 4 tons. (3) As a forecarriage for attaching to and working binders, mowers, ploughs, waggons, &c." Price 320*l*.

It will be remembered that this implement was given a trial at the last Meeting of the Society at Park Royal, when it was found deficient in several details. The Judges then recommended that it should be exhibited as a "New Implement" in the following year, thus giving the inventor more time to perfect the machine. The chief improvements this year are the introduction of a carburettor to burn petroleum oil and the strengthening of the transmission gear when driving with all three wheels. The forecarriage attachment is also new.

Article 1274.—"Section Remover, manufactured by W. Rawlinson, for removing worn sections from knife backs of mowers and reapers." Price 10*s*. each.—This was an

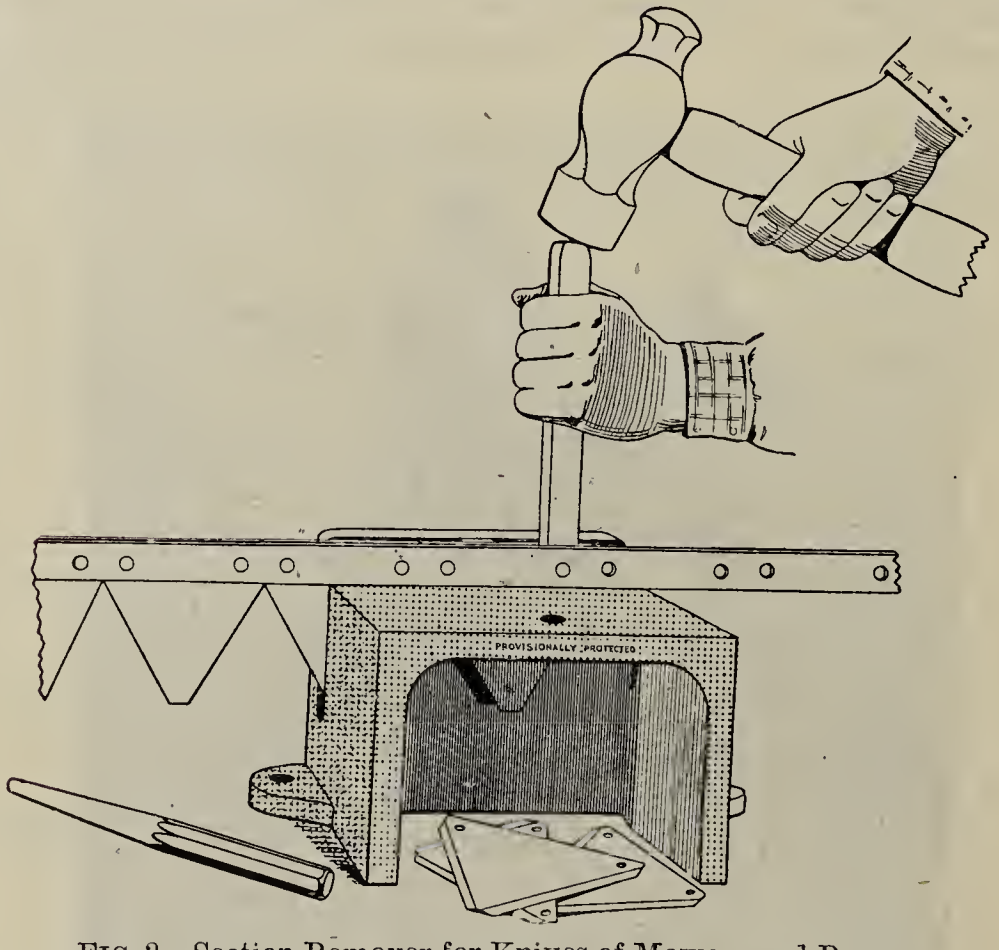

FIG. 2.—Section Remover for Knives of Mowers and Reapers.

extremely ingenious tool for removing a section by utilising the section as its own shear, the blow being delivered on the back of the section opposite the rivet, thus shearing the rivet, the ends of which are punched out of the knife back with a suitable punch provided.

OTHER "NEW IMPLEMENTS."

Article 854.—*Messrs. Sharman & Ladbury*, Melton Mowbray, "Hand Drag Rake, 'Self-emptying,' Newbery's Patent." Price 1*l.* 10*s.*—This implement has two rows of steel teeth, one on each side of the head, and on the rake becoming full the operator presses a spring and the head turns over and rakes from the opposite side, thus making the rake "self-emptying."

Article 951.—*Messrs. J. B. Edlington & Co., Ltd.*, Phœnix Iron Works, Gainsborough. "Mower and Swath Turner combined, two-horse, with iron frame, open gear, two speeds, 4 ft. 6 in. right hand cutting bar, roller bearings, fitted with Peel's Patent Swath Turner." Price 23*l.*—The idea of this machine is to turn the grass directly it is cut and so expose the cut ends to the drying effect of the sun and wind. This, it is claimed, seals the ends of the grasses, thereby causing them to lose less weight.

Article 1116.—*Messrs. Wooddisse & Desborough*, Ashbourne and Derby. "A Sacklifter and Barrow, manufactured by Wilkerson, of Bassingbourne, Herts." Price 3*l.*—This article was full of nice points, all calculated to make the working more efficient or safer for the operator.

Article 1801.—*Messrs. Pullan & Mann*, Cambrian Works, Leeds. "Steam Power Tile Press." Price 150*l.*—With automatic feed, and delivery specially adapted for pressing encaustic-tiles, &c., from dry clay dust, which hitherto has only been done by hand screw presses. The output of this press is about four times more than the hand presses, with great saving of labour. We saw this machine at work and were much struck with the cohesiveness of the tile pressed from the dry clay dust.

Article 2667.—*Mr. Thomas Newton*, 48 King Street, West Manchester. "Humane Rabbit Trap, Paige's Patent." Price 2*s.* 6*d.*—The essential features of this trap consisted of a combination of springs and a leather noose. The noose was placed, in the form of an open slip knot, round the edge of the trigger plate in such a manner that the rabbit's leg should be caught by it, when the trap was sprung and the noose drawn tight by the springs. The inventor claimed that there was no tendency to lacerate the leg, owing to the softness of the leather, or to dislocate the limb, owing to all shock being taken up by the springs.

Article 3122.—*Messrs. G. F. Braggins & Co.*, Banbury, Oxfordshire. "Patent Wheel, for Wheelbarrow and other purposes requiring strength and small diameter." Price from 4*s.*—These wheels were made up as a solid panel of wood and the spaces between the spokes were cut out afterwards. The Judges recommended that one of these wheels should be shown at the

next Meeting of the Society after it had been used for some time by some independent person who could certify as to the nature and period of the usage.

Article 3540.—*The Dairy Supply Company, Ltd.*, 28 Museum Street, London, W.C. "Cream Separator, manufactured by the Aktiebolaget Separator, Stockholm." Price 13*l.*—"Alfa Laval" (Patent), new 1906 model, "Humming Bird 2," capacity 45 gallons per hour. Features: Perfect protection of the spindle from risk of injury, top bearing renewable at a cost of 1*s.* only, and without requiring skilled labour; stronger gearing, larger bearings, stouter construction; all resulting in larger capacity, more perfect separation, easier working, and longer wear. The power required to work this sized separator is one-twentieth of 1 H.P., and it is guaranteed to leave only two-thirds as much butter-fat in the milk as the present style of "Alfa Laval."

Miscellaneous.

Article 3062.—*Messrs. Bacon & Curtis, Ltd.*, Poole, Dorset. "Fence Making Machine, 'Thrift,' for making fencing of any height or closeness." Price 15*l.* 15*s.*—This is an apparatus

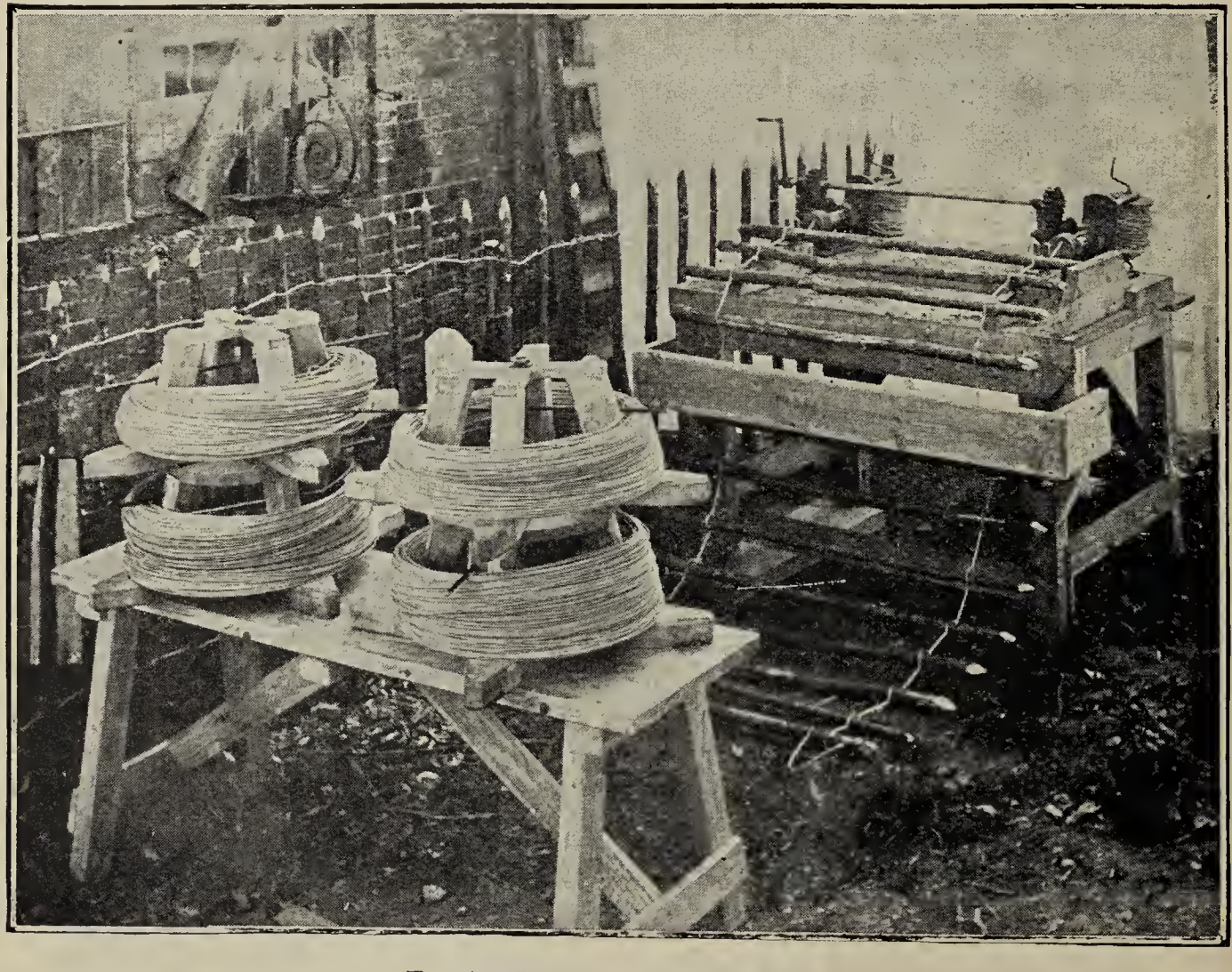

Fig. 3.—Fence Making Machine.

which should be of use on estates where there is either underwood or larch thinnings to be disposed of, and where a cheap fence is required.

Stand No. 322.—*Messrs. Jordan Brothers*, Bateman Street, Derby, exhibited a "'Ferret' Drain Clearing Apparatus."—This was a very clever arrangement for clearing drains. It consisted of a helix of steel wire which was stiff enough to enable the operator to push it through an obstruction, and yet it was sufficiently flexible to pass round the bends of a D or Syphon trap. One end of each length was reduced in size so that it could be screwed into the next one, and this joint was so rigid that it required a special wrench to take it apart.

In conclusion, the best thanks of my colleague, Mr. Thomas Stirton, and myself are due to the Stewards of Implements, Mr. R. Neville-Grenville and Mr. Claude M. S. Pilkington; also to Mr. F. S. Courtney, the Society's Consulting Engineer.

BAYNTUN HIPPISLEY.

Ston Easton Park,
Nr. Bath.

BUTTER AND MILK TESTS AT THE DERBY SHOW, 1906.

I. BUTTER TESTS (CLASS 180, A & B).

ALTHOUGH the prizes offered for cattle entering for these tests were on the same liberal scale at Derby as at Park Royal in 1905, the conditions being also similar, the number of cattle competing was smaller than last year.

The prizes were awarded on the same scale of points as at previous Shows, and the conduct of the tests was in every way like that which always governs these trials. Full particulars are given in Table I. on pp. 190 and 191.

The animals were weighed and divided into their respective class of over and under 900 lb. live weight, on Tuesday, June 26, and were stripped out on the Wednesday evening, the milk of the next twenty-four hours being taken both for the milk-yield and butter-test trials.

The breeds represented were as follows:—Shorthorns, Lincolnshire Red Short-horns, South Devons, Jerseys, and Guernseys, the numbers being shown in Table II. on page 192 for comparison with those tested in 1905.

TABLE I.—RESULTS OF BUTTER TESTS AT DERBY, JUNE 28, 1906.

CLASS 180 A.—COWS OF ANY AGE, BREED, OR CROSS, EXCEEDING 900 LB. LIVE WEIGHT. 10 ENTRIES.

No. in Catalogue	Exhibitor	Name of cow	Breed	Live weight	Date of birth	Date of last calf	No. of days in milk	Milk yield in 24 hours	Butter yield	[1]Ratio, viz., lb. milk to 1 lb. butter	Colour and quality of butter		No. of points for butter	No. of points for lactation	Total No. of points	Awards	CHURNING TABLE					
																	Time			Temperature, ° F.		
											Colour	Quality					Began	Finished	Duration (minutes)	Dairy	Cream and churn	Buttermilk
				Lb.		1906		Lb.oz.	Lb.oz.													
865	E. Appleyard	Valentia	Shorthorn.	1204	Aug. 9, '01	April 21	68	23 0	1 4¾	17·73	Fair	Poor	20·75	2·80	23·55	—	10 3	10 23	20	52	52	51
900	J. Evens	Burton 4th	L'nc'n Red	1288	April 23, '00	May 15	44	68 0	2 2½	31·53	Good	Good	34·50	·40	34·90	H. C.	9 55	10 20	25	52	52	53
1007	W. P. Vosper.	Margaret	S. Devon	1764	Aug. 1, '00	March 11	109	55 12	1 15¾	28·09	Very good	Very good	31·75	6·90	38·65	H. C.	10 5	10 47	42	52	52	54
1008	W. P. Vosper.	Primula 2nd	S. Devon	1764	Jan. 31, '98	March 1	119	56 2	2 4¼	24·77	Very good	Very good	36·25	7·90	44·15	3rd prize, 5*l.*	10 9	10 56	47	52	52	53
1301	R. B. Ward	Lucy	Jersey	945	July 24, '00	Jan 30	149	30 10	1 10¾	18·31	Excellent	Very good	26·75	10·90	37·65	Cert. of Merit	11 37	12 30	53	54	52	53
1375	H. M. Ozanne.	Scarchlight	Guernsey	1015	Jan. 5, '00	June 1	27	38 0	1 15¾	19·14	Excellent	Good	31·75	Nil	31·75	—	12 27	12 52	25	55	52	53
1478	J. Evens	Burton Vic 2nd	L'nc'n Red	1260	Aug. 27, '98	Dec 24, '05.	186	48 2	1 14	25·66	Very good	Excellent	30·00	12·00	42·00	R. & H. C.	2 27	3 46	79	57	52	58
1481	R. Shelton	Lady Mainstay	Shorthorn.	1253	1898	1906 May 22	37	70 6	3 4	21·65	Good	Fair	52·00	Nil	52·00	1st prize, 15*l.*, & 1st S.P., 20*l.*[3]	2 35	2 55	20	57	52	53
1485	Dr. H. Watney	Lady Siphon	Jersey	928	May 20, '97	Feb 9	139	32 10	2 0	16·31	Fair	Fair	32·00	9·90	41·90	Cert. of Merit	4 12	4 50	38	59	52	55
1487	Dr. H. Watney	Red Maple	Jersey	1011	July 14, '96	April 5	84	52 10	2 9½	20·28	Good	Good	41·50	4·40	45·90	2nd prize, 10*l.*, & B.M.,[2] & R.N. for S.P.[3]	3 43	4 40	57	59	52	55

[1] The "Butter Ratio" represents the number of lb. of milk required to make 1 lb. of butter. Ten lb. of milk are reckoned as equal to an imperial gallon.
[2] Bronze Medal, [3] Special Prize of the English Jersey Cattle Society.

TABLE I.—RESULTS OF BUTTER TESTS AT DERBY, JUNE 28, 1906—(*continued*).

CLASS 180 B.—COWS OF ANY AGE, BREED, OR CROSS NOT EXCEEDING 900 LB. LIVE WEIGHT. 15 ENTRIES.

No. in Catalogue	Exhibitor	Name of cow	Breed	Live weight	Date of birth	Date of last calf	No. of days in milk	Milk yield in 24 hours	Butter yield	Ratio, viz., lb. milk to lb. butter	Colour and quality of butter		No. of points for butter	No of points for lactation	Total No. of points	Awards	CHURNING TABLE					
																	Time			Temperature, ° F.		
											Colour	Quality					Began	Finished	Duration (minutes)	Dairy	Cream and churn	Buttermilk
				Lb.		1906		Lb. oz.	Lb. oz													
1279	Bishop Fisher	Oxford Dewdrop	Jersey	861	Mar. 28, '97	Mar. 28	92	45 0	2 2¾	20·71	Good	Fair	34·75	5·20	39·95	Cert. of Merit	10 5	10 50	45	52	52	53
1284	A. Miller-Hallett	Golfina	Jersey	728	Feb. 16, '01	April 7	82	43 8	1 12½	24·42	Fair	Poor	28 50	4·20	32·70	—	10 8	10 34	26	52	52	51
1287	C. and M. Palmer	May	Jersey	854	Mar. 29, 97	Jan. 16	163	27 12	1 4¾	21 39	Very good	Very good	20·75	12·00	32·75	—	10 40	11 47	67	53	52	53
1288	C. and M. Palmer	Sugar Maple	Jersey	819	Feb. 10, '98	Mar. 25	95	31 2	1 6¾	21·89	Excellent	Excellent	22 75	5·50	28 25	—	10 42	11 26	44	53	52	53
1289	C. and M. Palmer	Virtue	Jersey	844	Nov. 5, '00	Mar. 3	117	32 14	1 7½	22·38	Excellent	Excellent	23·50	7·70	31·20	—	10 48	11 23	35	53	52	52
1294	Lord Rothschild	Syren 3rd	Jersey	820	April 26, '96	Mar. 23	97	45 0	1 13¾	24·20	Good	Fair	29 75	5·70	35·45	Cert. of Merit	11 13	12 26	73	54	52	53
1300	Major Tennant	Daisy	Jersey	840	Mar., 1900	Feb. 22	126	36 8	2 8¾	14·33	Excellent	Excellent	40·75	8·60	49·35	G.M.,[3] 1st prize, 15*l.*, & 2nd S.P., 10*l.*[4]	11 21	12 56	35	54	52	53
1320	C. and M. Palmer	Vespa	Jersey	637	Mar. 19, '04	Mar. 25	95	22 12	1 3	19·15	Good	Very good	19·00	5·50	24·50	—	11 42	1 5	83	54	52	54
1376	H. M. Ozanne	Lady Roberts	Guernsey	861	Feb. 5, '95	April 19	70	32 6	1 7¾	21·81	Excellent	Excellent	23·75	3·00	26·75	—	11 50	12 25	35	54	52	55
1477	Lady de Rothschild	Witch	Jersey	876	April 11, '99	Feb. 1	147	39 10	2 1½	18·92	Good	Good	33·50	10 70	44·20	Cert. of Merit	2 30	3 10	40	57	52	54
1479	A. Miller-Hallett	Salvadora	Jersey	896	Mar. 18, '99	Jan. 9	170	31 12	2 0¼	15·75	Good	Good	32·25	12·00	44·25	R.N. & Cert. of Merit	2 31	3 39	68	57	52	55
1482	G. Murray Smith	Gloriole	Jersey	784	May 9, '97	Mar. 8	112	33 4	1 11¾	19·17	Very good	Excellent	27·75	7·20	34·95	—	2 38	3 15	37	57	52	55
1483	J. H. Smith-Barry	Marigold	Jersey	868	June 7, '01	Jan. 2	177	42 14	2 1	20·78	Excellent	Very good	33·00	12·00	45·00	3rd prize, 5*l.*	3 10	3 40	30	58	52	55
1484	R. Bruce Ward	Silken Lass	Jersey	812	Sept. 30, '02	Mar. 29	91	34 4	1 10	21·07	Good	Good	26·00	5·10	31·10	Cert. of Merit	3 37	4 30	53	58	52	56
1488	Dr. H. Watney	Violette	Jersey	896	1897	Mar. 29	91	43 0	2 9	16·78	Excellent	Excellent	41·00	5·10	46·10	2nd prize, 10*l.*, 3rd S.P., 5*l.*,[4] & S.M.[2]	4 5	4 46	41	59	52	55

[1] The "Butter Ratio" represents the number of lb. of milk required to make 1 lb. of butter. Ten lb. of milk are reckoned as equal to an imperial gallon.

[2] Silver Medal, [3] Gold Medal, [4] Special Prize of the English Jersey Cattle Society.

TABLE II.

Breed	Park Royal, 1905	Derby, 1906
	No.	No.
Shorthorns	5	2
Lincolnshire Red Short-horns	1	2
South Devon	2	2
Red Polled	2	—
Jerseys	21	17
Guernseys	4	2
Totals	35	25

The following Table gives the result of the competition so far as the prize winners are concerned :—

TABLE III.—*Prize Winners in Butter-test Competition.*

CLASS 180 A.—COWS EXCEEDING 900 LB. LIVE WEIGHT.

Name of exhibitor	Name of cow	Breed	Live weight	Days in milk	Milk	Butter	Ratio	Points	Result
			Lb.		Lb.oz.	Lb. oz.	Lb.		
R. Shelton	Lady Mainstay	Sh'thorn	1253	37	70 6	3 4	21·65	52·00	1st Prize
Dr. Watney	Red Maple	Jersey	1011	84	52 10	2 9½	20·28	45·90	2nd Prize
W. P. Vosper	Primula 2nd	S. Devon	1764	119	56 2	2 4¼	24·77	44·15	3rd Prize

CLASS 180 B.—COWS 900 LB. LIVE WEIGHT AND UNDER.

Major Tennant	Daisy	Jersey	840	126	36 8	2 8¾	14·33	49·33	1st Prize
Dr. Watney	Violette	Jersey	896	91	43 0	2 9	16·78	46·10	2nd Prize
J. H Smith-Barry	Marigold	Jersey	868	177	42 14	2 1	20·78	45·00	3rd Prize

The three special prizes of 20*l*., 10*l*., and 5*l*., and the Gold, Silver, and Bronze Medals (the latter for Jersey cows only), given by the English Jersey Cattle Society, were awarded as below :—

Special Prize 20*l*.	Mr. R. Shelton's Mainstay	Shorthorn.
,, ,, 10*l*.	Major Tennant's Daisy	Jersey.
,, ,, 5*l*.	Dr. Watney's Violette	Jersey.
Gold Medal	Major Tennant's Daisy.	
Silver Medal	Dr. Watney's Violette.	
Bronze Medal	Dr. Watney's Red Maple.	

Sixteen animals out of the 25 competing received prizes, highly commended cards, or certificates of merit, the result in this respect being in about the same proportion as last year.

The averages of all the cattle tested are set out in Table IV., from which it will be seen that with the exception of the Jerseys, all the breeds competing show an improvement over the results of 1905.

TABLE IV.—*Averages of Cattle Tested.*

No. of cows competing	Breed	Live weight	Days in milk	Milk	Butter	Ratio	Points
		Lb.		Lb. oz.	Lb. oz.	Lb.	
2	Shorthorns .	1228	52	46 11	2 4⅜	20·53	37·77
2	Lincoln Red do.	1274	115	58 1	2 0¼	28·80	38·45
2	South Devons .	1764	114	55 15	2 2	26·32	41·40
2	Guernseys . .	938	48	35 3	1 11¾	20·28	29·25
17	Jerseys . .	848	119	36 12½	1 14¼	19·47	37·95

As some of the cattle included in the above were not entered for the milk-yield tests, a sample of their milk was not taken for analysis. It is therefore impossible to compare the average yields of butter with the calculated yields as was done in last year's report.

II. MILK-YIELD TESTS.

As in the butter-test classes, the milk-yield prizes given by the Society at Derby were on the same liberal scale as in 1905, the conditions for entry and the points to be gained—with one slight alteration—being similar to those of the preceding year. The one alteration was that the Jerseys and Guernseys, in order to qualify for a prize or commendation, had to obtain the same number of points as the cows of the larger milking breeds.

The following scale of points regulated the prizes: 1 point for every pound of milk; 1 point for every completed ten days since calving, deducting the first forty days. Maximum points for lactation, 12. Four points for every 1 per cent. of fat shown on the average of the two milkings. Fractions of pounds of milk, percentages of fat, and incomplete periods of less than ten days were worked out in decimals and added to the total points. No prize or commendation was given unless the following points were obtained:—

	Cows above 5 years of age	Cows and heifers under 5 years of age
Shorthorn, Lincolnshire Red Short-horn, South Devon, Red-Polled, Ayrshire, Longhorn, Jersey, and Guernsey .	55	50
Kerry or Dexter	40	35

In cases of equality of points, it was provided that the prize should be awarded to the cow which had been the longest time in milk. Highly commended cards were given to all animals, other than the winners of the prizes, which obtained the above-mentioned points.

TABLE V.—MILK-YIELD CLASSES AT DERBY, 1906.

No in Catalogue	Exhibitor	Name of cow	Date of birth	Date of last calf	No. of days in milk	Total milk yield in 24 hours	Fat per-cent-age	Points				Awards
								Milk	Fat per cent. by 4	Lacta-tion	Total	
Class 97		*Shorthorns*		1906.		Lb. oz.						
[1]863	C. R. W. Adeane	Lady Crystal Bates	Oct. 3, 1900	May 29	30	43 12	3·27	43·75	13·08	Nil	56·83	1st Prize, 10*l.*, & H.C.S.C.[2]
[1]865	E. Appleyard	Valentia	Aug. 9, 1901	Apr. 21	68	23 0	5·25	23·00	21·00	2·80	46·80	Not up to standard.
866	W. A. H. Bass	Lady Dorothy 50th	May 20, 1901	May 21	38	42 6	3·60	42·37	14·40	Nil	56·77	2nd Prize, 5*l.*
868	J. T. Hobbs	Orange Blossom 13th	Sept. 27, 1894	Apr. 11	78	47 6	2·72	47·37	10·88	3·80	62·05	Deficient in fat.
[1]869	Lord Rothschild	Moppy Gem 5th	Apr. 10, 1897	May 30	29	63 6	2·95	63·37	11·80	Nil	75·17	Deficient in fat.
[1]871	Lord Rothschild	Warwickshire Hettie	July 15, 1899	Mar. 23	97	55 8	2·80	55·50	11·20	5·70	72·40	Deficient in fat.
[1]872	George Taylor.	Darling 4th.	June 14, 1899	Apr. 28	61	50 10	2·80	50·62	11·20	2·10	63·92	Deficient in fat.
873	C. E. Wodehouse	Blue Eyes	Feb. 18, 1898	May 8	51	40 0	3·17	40·00	12·68	1·10	53·78	Not up to standard.
Class 105		*Lincolnshire Reds*										
[1]900	John Evens	Burton 4th	Apr. 23, 1900	May 15	44	68 0	3·10	68·00	12·40	0·40	80·80	1st Prize, 10*l.*, & 2nd Prize S.C., 10*l.*[2]
[1]901	John Evens	Burton Primrose 2nd	Apr. 19, 1899	Apr. 20	69	64 6	3·02	64·37	12·08	2·90	79·35	2nd Prize, 5*l.*, & R.N.H.C. S.C.[2]
902	John Evens	Burton Quality 3rd	Feb. 24, 1901	June 11	17	48 10	2·80	48·62	11·20	Nil	59·82	Deficient in fat.
Class 120		*South Devons*										
[1]1007	W. P. Vosper	Margaret	Aug. 1, 1900	Mar. 11	109	55 12	3·60	55·75	14·40	6·90	77·05	2nd Prize 5*l.* & H.C.S.C.[2]
[1]1008	W. P. Vosper	Primula 2nd	Jan. 31, 1898	Mar. 1	119	56 2	3·97	56·12	15·88	7·90	79·90	1st Prize, 10*l.*, & 3rd Prize S.C., 5*l.*[2]
Class 137		*Red Polled*										
1089	Lord Amherst of Hackney	Waxlight 2nd	Feb. 26, 1902	Jan. 30	149	14 2	2·87	14·12	11·48	10·90	36·50	Deficient in fat.
1090	Sir Walter Corbet, Bt.	Biddy 2nd	Jan. 5, 1898	Apr. 26	63	36 4	3·62	36·25	14·48	2·30	53·03	Not up to standard.
1091	Sir Walter Corbet, Bt.	Linda 3rd	Apr. 20, 1898	Apr. 29	60	49 14	3·32	49·87	13·28	2·00	65·15	1st Prize, 10*l.*
[1]1093	Lord Rothschild	Clarissa	Dec. 1, 1898	May 9	50	47 2	3·50	47·12	14·00	1·00	62·12	2nd Prize, 5*l.*, & H.C.S.C.[2]
1094	Lord Rothschild	Passion Flower	Aug., 1900	Apr. 16	73	35 4	4·25	35·25	17·00	3·30	55·55	3rd Prize, 3*l.*
1096	G. Dudley Smith	Lollypop	Jan. 5, 1900	Apr. 5	84	34 0	3·27	34·00	13·08	4·40	51·48	Not up to standard.
Class 152		*Ayrshires*										
1221	Thomas Barr	Monkland Kate.	Apr. 12, 1902	Mar. 6	114	39 10	3·97	39·62	15·88	7·40	62·90	1st Prize, 10*l.*
Class 159		*Jerseys*										
[1]1279	Bishop Fisher	Oxford Dewdrop	Mar. 28, 1897	Mar. 28	92	45 0	4·45	45·00	17·80	5·20	68·00	2nd Prize, 5*l.*, & H.C.S.C.[2]
[1]1284	A. Miller-Hallett	Golfina.	Feb. 16, 1901	Apr. 7	82	43 8	3·67	43·50	14·68	4·20	62·38	R.N.H.C. & H.C.S.C.[2]
[1]1287	C. & M. Palmer	May	Mar. 29, 1897	Jan. 16	163	27 12	4·22	27·75	16·88	12·00	56·63	H.C. & H.C.S.C.[2]
[1]1288	C. & M. Palmer	Sugar Maple	Feb. 10, 1898	Mar. 25	95	31 2	4·07	31·12	16·28	5·50	52·90	Not up to standard.
[1]1289	C. & M. Palmer	Virtue	Nov. 5, 1900	Mar. 3	117	32 14	4·17	32·87	16·68	7·70	57·25	H.C., & H.C.S.C.[2]

[1] These animals were also entered for the Special Milk-yield Competition (Class 181), see Table VI., page 196.

[2] S.C.=Special Class.

TABLE V.—MILK-YIELD CLASSES AT DERBY, 1906—*continued.*

No. in Catalogue	Exhibitor	Name of cow	Date of birth	Date of last calf	No. of days in milk	Total milk yield in 24 hours	Fat per-centage	Points				Awards
								Milk	Fat per cent. by 4	Lacta-tion	Total	
Class 159	—continued.	*Jerseys*—continued.		1906.		Lb. oz.						
1294	Lord Rothschild	Syren 3rd	Apr. 26, 1896	Mar. 23	97	45 0	3·85	45·00	15·40	5·70	66·10	3rd Prize, 3*l.*
1295	G. Murray-Smith	Jersey Carol	May 5, 1902	May 2	57	32 4	3·25	32·25	13·00	1·70	46·95	Not up to standard.
1300	Major Tennant	Daisy	March, 1900	Feb. 22	126	36 8	6·02	36·50	24·08	8·60	69·18	1st Prize, 10*l.*
[1]1301	R. Bruce Ward	Lucy	July 24, 1900	Jan. 30	149	30 10	5·12	30·62	20·48	10·90	62·00	H.C., & H.C.S.C.[2]
1302	R. Bruce Ward	Mrs. Viola	Aug. 1, 1900	May 14	45	40 6	4·02	40·37	16·08	0·50	56·95	H.C.
[1]1320	C. & M. Palmer	Vespa	Mar. 19, 1904	Mar. 25	95	22 12	4·70	22·75	18·80	5·50	47·05	Not up to Standard.
Class 166		*Guernseys*										
1367	E. A. Hambro.	Express	Mar. 26, 1895	May 27	32	41 6	3·65	41·37	14·60	Nil	55·97	H.C.
1368	E. A. Hambro.	Mrs. Dreyfus	Aug. 26, 1900	June 4	24	44 0	3·20	44·00	12·80	Nil	56·80	3rd Prize, 3*l.*
1370	F. Hargreaves	Merton Beauty of the Village	Jan. 9, 1902	May 21	38	40 14	3·37	40·87	13·48	Nil	54·35	H.C.
1371	F. Hargreaves	Merton Rosette of the Gron	May 3, 1902	May 20	39	37 2	2·80	37·12	11·20	Nil	48·32	Deficient in fat.
1372	Sir H. Lennard, Bt.	Lady 77th	Nov. 24, 1898	Mar. 26	94	35 14	3·85	35·87	15·40	5·40	56·67	R.N.H.C.
1375	H. M. Ozanne.	Searchlight.	Jan. 5, 1900	June 1	27	38 0	4·72	38·0	18·88	Nil	56·88	2nd Prize, 5*l.*
1376	H. M. Ozanne.	Lady Roberts	Feb. 5, 1895	Apr. 19	70	32 6	4·20	32·37	16·80	3·00	52·17	Not up to standard.
1377	H. F. Plumptre	Muriel 12th.	Apr. 16, 1901	Apr. 30	59	43 6	4·90	43·37	19·60	1·90	64·87	1st Prize, 10*l.*
Class 171		*Longhorns*										
1410	W. H. Sale	Lady Panza	Sept. 8, 1902	May 2	57	36 8	5·32	36·50	21·20	1·70	59·40	1st Prize, 10*l.*
Class 175		*Kerries*										
1422	Lady Greenall	Aicme Cold.	March, 1896	Apr. 30	59	34 4	3·62	34·25	14·48	1·90	50·63	2nd Prize, 5*l.*
1423	Lady Greenall	Walton Joyous	Apr. 10, 1902	Apr. 28	61	47 14	3·25	47·87	13·00	2·10	62·97	1st Prize, 10*l.*
1424	The Duchess of Newcastle	Hardwick Flora	Apr. 23, 1898	May 4	55	27 12	3·12	27·75	12·48	1·50	41·73	R.N.H.C.
1425	The Duchess of Newcastle	Sheen 6th	Apr. 3, 1896	Apr. 19	70	22 4	4·0	22·25	16·00	3·00	41·25	H.C.
1427	R. T. Robertson	Belvedere Nora.	Mar. 24, 1901	May 3	56	27 8	4·72	27·50	18·88	1·60	47·98	3rd Prize, 3*l.*
Class 179		*Dexters*										
1450	B. de Bertodano	Cowbridge Dainty Dish.	March, 1902	June 3	25	38 2	4·17	38·12	16·68	Nil	54·80	2nd Prize, 5*l.*
1451	B. de Bertodano	Cowbridge Lorna	March, 1900	May 20	39	32 14	3·77	32·87	15·08	Nil	47·95	H.C.
1452	The Duchess of Devonshire.	Compton Daphne	1900	Apr. 23	66	31 12	3·87	31·75	15·48	2·60	49·83	3rd Prize, 3*l.*
1453	The Duchess of Devonshire.	Compton Dark Beauty	1900	Apr. 16	73	28 14	3·05	28·87	12·20	3·30	44·37	H.C.
1454	The Duchess of Devonshire.	Compton Dorcas	1899	May 28	31	32 14	4·12	32·87	16·48	Nil	49·35	R.N.H.C.
1456	H. M. Gibbs	Barrow Gunga	1901	Apr. 25	64	30 12	2·55	30·75	10·20	2·40	43·35	Deficient in fat.
1457	R. T. Robertson	La Mancha Noble Lassie	1897	May 18	41	24 6	3·65	24·37	14·60	0·10	39·07	Not up to standard.
1458	R. T. Robertson	Sprucefield Edna	1900	May 26	33	41 14	3·30	41·87	13·20	Nil	55·07	1st Prize, 10*l.*

[1] These animals were also entered for the Special Milk-yield Competition (Class 181), see Table VI., page 196.

[2] S.C.=Special Class.

TABLE VI.—CLASS 181.—SPECIAL MILK-YIELD CLASS FOR COWS OF ANY AGE, BREED, OR CROSS.

No. in Catalogue	Exhibitor	Name of cow	Breed	Date of birth	Date of last calf	No. of days in milk	Total milk yield in 24 hours.	Fat percentage	Points				Awards
									Milk	Fat per cent. by 4	Lactation	Total	
							Lb. oz.						
1299	Lady Smyth	Lily's Fancy.	Jersey	May 24, 1902	May 6	53	38 8	4·42	38·50	17·68	1·30	57·48	H.C.
1477	Lady de Rothschild	Witch	Jersey	Apr. 11, 1899	Feb. 1	147	39 10	4·90	39·62	19·60	10·70	69·92	H.C.
1478	J. Evens	Burton Vic 2nd	Lincoln Red	Aug. 27, 1898	Dec. 24, '05	186	48 2	3·80	48·12	15·20	12·00	75·32	H.C.
1479	A. Miller-Hallett	Salvadora	Jersey	Mar. 18, 1899	Jan. 9	170	31 12	5·95	31·75	23·80	12·00	67·55	H.C.
1481	R. Shelton	Lady Mainstay	Shorthorn	1898	May 22	37	70 6	4·65	70·37	18·60	Nil	88·97	1st Prize, 20*l.*
1483	J. H. Smith-Barry	Marigold	Jersey	June 7, 1901	Jan. 2	177	42 14	4·65	42·87	18·60	12·00	73·47	H.C.
1485	Dr. H. Watney	Lady Siphon	Jersey	May 20, 1897	Feb. 9	139	32 10	5·47	32·62	21·88	9·90	64·40	H.C.
1487	Dr. H. Watney	Red Maple	Jersey	July 14, 1896	Apr. 5	84	52 10	4·40	52·62	17·60	4·40	74·62	H.C.
1488	Dr. H. Watney	Violette.	Jersey	1897	Mar. 29	91	43 0	5·40	43·00	21·60	5·10	69·70	H.C.
1489	J. Evens	Iris.	Shorthorn	1899	May 21	38	66 8	2·85	66·50	11·40	Nil	77·90	Deficient in fat.

Animals entered in the Milk-yield Classes of the various Dairy Breeds were also eligible for entry in Class 181. For the awards to such animals, see Table V., on pp. 194 and 195.

The 2nd and 3rd prizes in Class 181 were awarded to No. 900 in Class 105 and No. 1008 in Class 120, see Table V., page 194.

The cattle were milked out on Wednesday evening, June 27, the milk of Thursday being taken for the trials. Both the morning and evening milks, after being weighed, were sampled and analysed by Dr. Voelcker.

Table V., on pp. 194 and 195, gives the full results of the competition in the milk-yield classes of the various breeds; while Table VI., on page 196, gives similar results in the special milk-yield class.

The number of cattle competing was less than in 1905, Table VII. showing the falling off to be twenty-six.

TABLE VII.

Breed	1905	1906
Shorthorns	18	10
Lincolnshire Red Short-horns	5	4
South Devons	2	2
Red Polled	8	6
Ayrshires.	5	1
Jerseys	21	18
Guernseys	9	8
Longhorns	2	1
Kerries	11	5
Dexters	8	8
Totals	89	63

As in last year's report the averages of the different breeds have been worked out, but in this report the special milk-yield class averages have not been incorporated with their respective breed class averages, the object being (*a*) to show that the yields of cattle specially bred and selected for milk reach a higher average than the others; (*b*) to encourage owners of milking cattle to breed animals up to the higher standard of the special classes. It will be noticed that only one animal was present in the Ayrshire and Longhorn classes. This is regrettable, as the Ayrshire breed has a deservedly high reputation for milk production.

Tables VIII. and IX., page 198, give the averages of all the different breeds that were entered for the open and special milk-yield prizes.

Out of these cows four Shorthorns, one Lincolnshire Red, one Red Polled, one Guernsey, and one Dexter were disqualified, their milk showing less than an average of 3 per cent. fat in the two milkings.

I am sorry to have to report a large number of disqualifications owing to the milk not being up to the standard, or being deficient in fat. The standard required, being based

on the average of the two milkings, cannot be considered unreasonable. The numbers of the cattle disqualified are as follows :—

4	Shorthorns	out of an entry of	8
1	Lincolnshire Red Short-horn	,,	3
1	Red Polled	,,	6
1	Guernsey	,,	8
1	Dexter	,,	8

The question of feeding cattle for these competitions is, in my opinion, intimately connected with their disqualification; but that is a subject too complicated to be gone into in this report.

TABLE VIII.—*Averages of all Breeds in the Milk-yield Classes.*

No. of cows competing	Breed	Days in milk	Milk	Fat	Points			
					Milk	Fat	Lactation	Total
			Lb. oz.					
8	Shorthorns .	56	45 12	3·32	45·75	13·28	1·60	60·63
3	Lincolnshire Red	43	60 5⅓	2·97	60·34	11·88	0·30	72·52
2	South Devons .	114	55 15	3·78	55·93	15·12	7·40	78·45
6	Red Polled .	79	36 1⅔	3·47	36·10	13·88	3·90	53·88
1	Ayrshires . .	114	39 10	3·97	39·62	15·88	7·40	62·90
11	Jerseys . .	101	35 4	4·32	35·25	17·28	6·10	58·63
8	Guernseys . .	48	39 2	3·83	39·12	15·32	0·80	55·24
1	Longhorns .	57	36 8	5·32	36·50	21·28	1·70	59·48
5	Kerries . .	60	31 14¾	3·74	31·92	14·96	2·00	48·88
8	Dexters . .	46	32 11	3·56	32·68	14·24	0·60	47·52

TABLE IX.—*Average of all Breeds entered in the Special Milk-yield Class.*

No of cows competing	Breed	Days in milk	Milk	Fat	Points			
					Milk	Fat	Lactation	Total
			Lb. oz.					
7	Shorthorns .	51	53 5	3·51	53·31	14·04	1·10	68·45
3	Lincolnshire Red	99	60 2½	3·30	60·15	13·20	5·90	79·25
2	South Devon .	114	55 15	3·78	55·93	15·12	7·40	78·45
1	Red Polled .	50	47 2	3·50	47·12	14·00	1·00	62·12
14	Jerseys . .	118	36 12⅐	4·68	36·76	18·72	7·80	63·28

III. EXPERIMENTS IN THE DAIRY.

As the Dairy was required for butter-making competitions in connection with the Midland Agricultural and Dairy College, and the Travelling Dairy School of the Derbyshire County Council, on two days during the Show, and the butter-test and

milk-yield competitions took up a third day, there was not the same opportunity as at Park Royal in 1905 for carrying out practical experiments.

Two, however, were attempted : the first to ascertain whether the public generally know the taste of genuine unadulterated butter ; the second to demonstrate that the more modern system of ceasing to churn, when the butter is in grain, is preferable to the old-fashioned plan of churning the butter into a lump, both in regard to the weight and the quality of the butter obtained.

Experiment No. 1.

Taste of Genuine compared with Adulterated Butter.

Four lots of Channel Islands cream, weighing respectively 4 lb. and 5 lb., and estimated to produce from 2 lb. to 3 lb. of butter, were taken from the same bulk.

Lot No. 1, weighing 4 lb., was churned at 54° F., churning being stopped when the butter came in grain. The butter was washed in the ordinary way (but not brined), and made up into a lump, the dairy work throughout being done as well as possible. The weight of this lot was 2½ lb.

Lot No. 2, weighing also 4 lb., was treated exactly the same as No. 1, save that just before the butter came in grain the churning was stopped, and ½ lb. of some rather nasty margarine was added ; the cost of the margarine was 5*d.* per lb. Churning was then continued, and the mixture was eventually made up into a lump weighing about 3 lb., the proportion of margarine being estimated at about 17 per cent.

Lot No 3, weighing 5 lb., was treated similarly to Nos. 1 and 2, but ½ lb. of butter substitute, costing 4*d.* per lb., was added to the butter as in the case of No. 2 ; the total weight of the mixture was about 3½ lb., the proportion of the butter substitute being estimated at about 15 per cent.

Lot No. 4, weighing 4 lb., was churned precisely as No. 1 ; but after the butter-milk had been drawn off, some warm separated milk was worked into the butter, the weight of the butter when finished exceeding the No. 1 Lot by 4 per cent.

Taking the value of the pure butter at 1*s.* 4*d.* per lb., and assuming that all the butter could be sold at the same price, which assumption will be shown later on to be not far wrong, the pecuniary gain obtained by adulteration is as follows :—

	Cost	Sold for	Gain
No. 1.—2½ lb. butter at 1*s.* 4*d.*	3*s.* 4*d.*	3*s.* 4*d.*	Nil
No. 2.—2½ lb. butter at 1*s.* 4*d.* = 3*s.* 4*d.*			
½ lb. marg. at 0*s.* 5*d.* = 0*s.* 2½*d.*	—3*s.* 6½*d.*	4*s.* 0*d.*	5½*d.*
No. 3.—3 lb. butter at 1*s.* 4*d.* = 4*s.* 0*d.*			
½ lb. substitute = 0*s.* 2*d.*	—4*s.* 2*d.*	4*s.* 8*d.*	6*d.*
No. 4.—2½ lb. butter at 1*s.* 4*d.* = 3*s.* 4*d.*			
¼ lb. water	—3*s.* 4*d.*	3*s.* 8*d.*	4*d.*

The profit to the dishonest manufacturer thus comes out at from 7½ per cent. to 10 per cent.

It might, however, be thought that the public would not be taken in by such mixtures, more particularly as they were made by amateurs at fraud, and therefore not nearly so skilfully done as at places which are specially laid out for these nefarious practices.

To test this the following plan was adopted : The samples were labelled Nos. 1, 2, 3, and 4 respectively, and during two days of the Show were passed round on four different occasions to the public watching the work that was going on in the Dairy, with a request that they would taste the various samples, and give me their opinion as to the quality, by holding up their hands for the sample they liked best as I called out the numbers, and keeping their hands up until I had counted them.

On every occasion No. 3 received the most votes, then No. 2, Nos. 1 and 4 being both about equally last.

The experiment, it is submitted, demonstrated all it was supposed to do, viz., that the public generally do not know the taste of genuine unadulterated butter.

Experiment No. 2.

Old and New Methods of Churning Compared.

Two equal lots of very thin cream from the same bulk were weighed out ; the one was churned as well as possible, the other into a lump. Both lots were treated alike in every other respect ; the temperatures of the creams and churns were the same, and the subsequent working was identical as far as possible. After being weighed, the two lots were judged for me by Professor Drummond, the samples being numbered 1 and 2 respectively. The weights of the butter were as below :—

	Weight of cream	Weight of butter
No. 1.—Churned into a lump . . .	10 lb.	1 lb. 14¾ oz.
No. 2.—Churning stopped when in grain	10 lb.	2 lb. 0 oz.

Professor Drummond's report was as follows :—

No 1.—Generally very good, if anything a little open in texture ; grain, fair ; body, very good ; flavour, sweet and pleasant. Total points, 94½.

No. 2.—The quality of this sample is fine ; colour, bright ; texture, a little open ; grain, very good ; flavour, fine, rather more full than No. 1. Total points, 96.

From the above it will be seen that No. 2 sample, which was churned correctly, was heavier and better in quality than No. 1. This experiment only confirms the generally received

opinion that the old-fashioned plan of churning butter into a lump is wrong from every point of view ; as, in addition to the differences mentioned above, the keeping quality of such butter is usually not first-rate.

In carrying out these experiments I received the greatest assistance from Mr. Barnardiston, my Assistant Steward, Mr. Gilbert, and the Staff of the Dairy, to all of whom I would express my indebtedness.

ERNEST MATHEWS.

Little Shardeloes,
Amersham.

AGRICULTURAL EDUCATION AND FORESTRY EXHIBITION, 1906.

THIS department of the Society's Annual Show was organised at Derby upon the same general lines as in previous years, in co-operation with Agricultural Colleges and other institutions. Mr. J. Bowen-Jones again acted as Steward. A pavilion for the accommodation of the exhibits, modelled upon the more permanent structure used for the same purpose at Park Royal, was built of timber and roofed with felt. It measured 112 ft. by 34 ft., and was divided into sixteen bays, each 14 ft. by 10 ft. Owing to the distance from London, the Meteorological Exhibition, held in 1905 at Park Royal, was not repeated ; but there were several other new and interesting features. These included exhibits illustrating the work of the new National Fruit and Cider Institute ; hides showing the injuries caused by the warble fly and by barbed wire ; and a particularly suggestive and instructive representation of Nature Study in Rural Schools, organised by the County Councils' Association. Reports, prospectuses, and other literature, issued by the contributing colleges, were distributed from a special bay under the charge of the Agricultural Education Association.

The following description is compiled from notes supplied by the exhibitors :—

I. AGRICULTURAL SCIENCE.

Rothamsted Experimental Station, Harpenden, Herts.—The Lawes Agricultural Trust showed the following series of diagrams :—

1. Five diagrams showing the results of the continuous growth of wheat for a period of fifty-one years, 1852-1902, on the Broadbalk Field at Rothamsted :—

Diagram 1 showed the effect of increasing amounts of nitrogen applied as salts of ammonia ; the amount of grain increased with each addition of nitrogen, but the straw received still greater benefit.

Diagram 2 showed a comparison between equal amounts of nitrogen applied as nitrate of soda or ammonia salts ; the nitrate of soda is the more effective manure for wheat at Rothamsted, especially as regards the straw.

Diagram 3 illustrated the law of diminishing returns, and showed that with increasing amounts of manure a point is reached when the extra yield ceases to be profitable ; and that this point is sooner reached when the prices for the grain and straw are low than when they are high.

Diagram 4 illustrated the results of applying salts of ammonia in autumn instead of in spring, or in alternate years instead of every year. There is always some loss with the autumn application, and in the second year the wheat receives no benefit from ammonia salts applied in the previous season.

Diagram 5 showed that the benefit of a summer fallowing on the succeeding wheat crop is lost if a wet autumn and early winter follow the fallowing.

2. Three diagrams illustrating the continuous growth of barley for fifty-one years, 1851-1902 :—

Diagram 6 showed the relative effects of quantities of nitrogen applied as ammonium salts, nitrate of soda, or rape cake, all of which gave the same returns when accompanied by phosphates and potash.

Diagram 7 showed that after farmyard manure had been applied for twenty years and then discontinued, a very large residue of fertility was left behind, which is still having an effect upon the crop, thirty-two years since the last application.

Diagram 8 showed the effect of different mineral manures upon barley, and illustrated the great value of phosphoric acid to this crop.

3. Experiments upon mangels at Rothamsted, twenty-seven years, 1876-1902 :—

Diagram 9 illustrated the dependence of the mangel crop upon nitrogenous manures, the yield increasing with each application of nitrogen.

Diagram 10 showed that of the mineral manures phosphates have but little effect, but that the crop required very large quantities of potash.

4. Experiments on crops grown in rotation at Rothamsted :—

Diagram 11 showed the effect of different manures when the land is thoroughly impoverished by cropping without manure. The swedes are reduced to a minimum, as also is the clover. The yield of wheat is, however, fairly well maintained ; as much as 19·6 bushels per acre were obtained in 1903, after fifty-six years without manure. It also shows that with mineral manures alone the yield of swedes and of clover was very greatly increased ; the wheat and barley not at all.

Diagram 12 illustrated the value of the clover crop in rotation as compared with a bare fallow. The yield of wheat is increased by 12 per cent., and the barley (three years after the clover) by 28 per cent.

Diagram 13 illustrated the benefit to succeeding crops of feeding swedes on the land instead of carting them away.

5. Four diagrams, illustrating the results of the Rothamsted Experiments on the Feeding of Cattle, Sheep, and Pigs :—

Diagrams 14 and 15 showed the amount of food (nitrogenous and non-nitrogenous) required per 100 lb. live-weight, and to produce 100 lb. increase in live-weight.

Diagrams 16 and 17 showed the percentage composition of the whole carcasses of animals in a store and fat condition, and also the composition of the increase during fattening.

Royal Agricultural College, Cirencester. — The College exhibited diagrams illustrating the chemical composition of foods, and the results of twenty years' continuous manurial experiments on grass land. The Natural History Department sent a number of the commoner fossils from the Jurassic formation on which the College is situated; a case showing the formation of soil from the oolite ; exhibits illustrating the life-histories of various insect pests, including the click beetle (with its larva, the wireworm), the frit fly, &c. ; certain fruits showing the modes of dispersal of seeds ; two cases illustrating the Natural Orders of the Insecta ; and two frames showing diseases which attack the leaves of trees. The Veterinary Department of the College sent anatomical and pathological specimens ; examples of drugs and plants used in medicine and to illustrate lectures on Materia Medica ; specimen horse shoes made at the College to illustrate the principles of shoeing ; and cultures of pathogenic organisms used in connection with bacteriological study and research. The Professor of Agriculture again sent the College collection of wools from different breeds of sheep, showing the varied length of staple and the fineness or otherwise of the fibre. He also exhibited samples of turf from Devonshire, grown on a clay subsoil, and illustrating the marked effect of the application of basic slag, as compared with turf from the same field where no slag had been applied.

Cambridge University Agricultural Department.—The exhibits were chiefly designed to explain and illustrate the Department's work in plant breeding. The interest of the collection was increased by photographs of sheep on which experiments have been made, and by a number of animal exhibits kindly lent by Mr. W. Bateson, F.R.S., and Mr R. C. Punnett, M.A., of Cambridge. The object of the latter group of specimens was to show that the same principles hold good in the breeding both of plants and animals.[1] The plants and animals represented were wheat, barley, sweet peas, sheep, rats, and fowls.

The first group of exhibits illustrated the effects of crossing two breeds differing in a single character. In crosses between wheats which differed only in being bearded or beardless, or in having a rough or smooth chaff, it was shown that the beardless condition and the hairiness of the chaff appear in their full intensity in the cross-breds. In the generation raised from these cross-bred plants, three of the beardless and the rough chaff are found, on the average, to each bearded or smooth-chaffed individual.

[1] See also the article at page 46 of this Volume on "The Application of Mendel's Laws of Inheritance to Breeding Problems," by R. H. Biffen, M.A.

Similarly, it was shown that if black and white rosecomb bantams are crossed, the cross-breds are all black. But when these cross-breds are mated and a number of chickens are hatched, it is found that three-quarters of the progeny are black and one-quarter white. And just as all the bearded or the smooth-chaffed wheats of the second generation breed true, while one-third only of the beardless and rough chaffs breed true; so it is found that all the white bantams of the second generation breed true, while two out of every three blacks will not do so.

It is possible to fix the black or white colour of the bantam, and also the bearded or beardless and rough or smooth characters in wheat; but it is not always possible to extract pure-breds from crosses in this way. Thus in the progeny of a cross between a short and long eared wheat it was found that short ears, long ears, and intermediate ears appeared; that it was possible to get both the long and the short ears to breed true; but that the intermediate ears would not fix, for these last appear to be permanent mongrels. A very interesting parallel case in fowls was shown, viz., the Blue Andalusian, which, like the intermediate wheat, is a permanent mongrel. A pure breed of Blue Andalusians cannot be made; so that, however long the pedigree, this fowl will always produce a certain proportion of dark or light coloured birds known by the breeders as "wasters." Such examples as these, which show that some pure-breds may be fixed in the second generation from the cross, and that other breeds will never fix, require an alteration in some of our ideas about "pedigree."

The uses to which these principles of breeding (Mendel's) may be put in producing new varieties was shown by several of the exhibits. For example, in barleys differing in two pairs of characters it was shown, when in one case the ears of barley were six-rowed and hooded and in the other two-rowed and bearded, that the cross-bred was two-rowed and hooded and that the descendants of the cross-bred consisted of the following types: six-row hooded, six-row bearded, two-row hooded, two-row bearded. The characters present in the original parents therefore appeared in fresh combinations. Certain of the individuals which showed these new combinations of characters bred true.

Not only characters, such as colour and hairiness, are inherited in a definite way, but it is now known that the power of plants to resist disease may follow the same laws. To demonstrate this important fact, an exhibit was arranged showing in one pot a variety of wheat immune to yellow rust, but otherwise of no value for general cultivation, and in a second

pot a variety excessively susceptible to this disease, with its foliage and stems badly attacked. These varieties had been crossed together two years previously, and in a third culture numbers of the descendants of the hybrid were shown. Some of these were excessively diseased, whilst others were entirely free from rust. All three cultures were grown under the same conditions.

Specimens were also exhibited from the field plots of these same hybrids showing fully developed plants. The resistant parent has dense ears; the susceptible has lax ears. Among the hybrids were dense-eared forms with badly infected foliage and stems, and amongst the lax-eared forms were some which were disease-resisting. It was thus shown that immunity and susceptibility to yellow rust could be transferred from one type to the other.

A considerable group of exhibits dealt with the formation and improvement of pastures. The Abbotsley pastures furnished material for a diagram which showed how slight may be the correspondence between the original seed mixture and the composition of the herbage of the resulting pasture. Turfs from the University Farm showed the effects of suitable manuring and of neglect on a five-year-old pasture; and a second series of turfs from a poor Boulder Clay pasture at Cransley, in Northamptonshire, showed how useless is the attempt to enrich such pastures by cake-feeding, or to improve them by liming, until the soil has first had a dressing of from 8 to 10 cwt. per acre of basic slag or superphosphate. In sharp contrast to the Cransley turfs, a third set from the north of England was introduced to show the class of soil which must be limed before manuring is resorted to.

South Eastern Agricultural College, Wye, Kent.—As in 1904, this College sent its collection illustrating the chemical and physical properties of typical soils in Kent and Surrey, in relation to the crops for which they are best adapted; also samples of nitrogenous manures for hop-gardens. A model and diagrams illustrated experiments on the digestibility of feeding stuffs. Fungoid pests of agricultural plants and fruits were illustrated. Living and dead specimens were shown of injurious insects. Those alive were exhibited in gauze-covered glass globes feeding on the plants they respectively injure. Labelled with their common and systematic names, and with brief descriptions of their characteristic habits, these exhibits made an interesting and instructive object lesson, especially to those occupied with fruit growing. The pests included the lackey moth (*Clisiocampa neustria*), the gooseberry saw fly (*Nematus ribesiæ*), the apple saw fly (*Hoplocampa testudinea*), the little ermine moth (*Hyponomeuta malinella*),

the gold tail moth (*Porthesia auriflua*), &c. From the Veterinary Department of the College were sent exhibits illustrating the parasites of sheep, including round worms (*Strongylidæ*), and types of horse shoes and preparations connected with the foot of the horse in health and disease.

Midland Agricultural and Dairy College, Kingston, Derby.—The College sent a series of pots showing the results of experiments to test the effects of superphosphate and salt upon the germination of seed. The experiments show that salt, if applied at the time of sowing, has an injurious effect upon germination, and that, if so applied, considerable risk is run of losing the plant in the event of a troublesome germinating period. Salt or saline manures should therefore be applied a month or two before sowing the seed. Other experiments with barley indicated the desirability of sowing artificial manures broadcast rather than with the seed in the drill, in which case it was liable to affect injuriously the germination. Specimens were shown of lucerne seeds, containing diseased seeds of a dark colour affected by some fungus. Considerable risk was incurred in sowing these seeds, as they could not be relied upon to germinate satisfactorily. Experiments are being carried on at the College in the raising of new varieties of potatoes of which one- and two-year-old seedlings were shown in pots. Of some of the varieties tested, good saleable tubers have been obtained within four years of the sowing of the potato seed.

The problem of nitrogen-assimilation continues to receive a great deal of attention at the College, and the new inoculation cultures from the United States and Germany have been the subject of careful investigation. Tares, peas, alsike, lucerne, and red clover were shown growing in pots containing boiled, sterilised quartz sand. The effect of inoculating the soil in these pots with pure cultures of nitrifying bacteria, obtained from Dr. Hiltner, of Munich, was shown to be greatly beneficial. A new system of inoculation by mixing dried sterilised soil with crushed healthy nodules containing nitrifying bacteria, as found on the roots of leguminous plants, is being tried at the College.

A series of cultures was shown consisting of dairy bacteria and moulds, some being essential to the production of good cheese, others having injurious properties. It is now usual to inoculate the milk with the organism that gives a cheese its distinctive flavours and to impregnate artificially the cheese-room with the mould without which, for instance, the successful manufacture of Camembert cheese is impossible. Another collection of exhibits illustrated the investigation of abnormal dairy produce, cases of animal poisoning, &c., as undertaken

for farmers in the counties supporting the College. Finally, a quantity of new apparatus, or of modified forms of existing apparatus, as used at the College, was shown and explained to visitors interested.

National Fruit and Cider Institute, Long Ashton, Bristol.— The exhibits were representative of the experimental work which is being carried on at the Institute in connection with fruit growing and cider making. Demonstration specimens illustrating the different methods of budding and grafting were shown side by side with the living trees which had been propagated by those means. Apple and pear trees in pots, including seedlings, one-year-old stocks, and budded and grafted stocks showing the one- and two-year-old growths from the time of working were also exhibited. The varieties shown were representative of the best cider and perry sorts. Specimens of the leading varieties of cider and perry fruit, preserved in cold storage ; fruit trees attacked by the most common insect pests and disease-producing fungi, as well as cultures of the fungi themselves ; apparatus for the pruning, spraying, &c., of fruit trees ; specimens showing the results of good and bad pruning, and demonstrations of various methods of bottling fruit, were also included. Photographs illustrating the orchard and nursery work, and showing methods of fencing and protecting young fruit trees in orchards, supplemented these exhibits.

The cider section included bottled samples (for purposes of tasting) of ciders made from single varieties of cider and perry fruit ; of various blends of these and also of others fermented with special yeasts ; various utensils used in cider making ; cultures of different types of yeasts and other organisms found in cider, and also of some of the more important bacteria which produce disorders of cider ; charts showing the varying rates of fermentation in different ciders, and photographs of the cider-house and machinery.

Hides damaged by Warbles and Barbed Wire. — Messrs. Michael Cozens & Sons, of Walsall, exhibited a series of raw and tanned hides, showing (1) the results of neglecting to treat live stock against the ravages of the warble fly and (2) the damage caused to cattle by the careless use of barbed wire. One of the hides exhibited, which was received from the slaughterman in May, 1906, contained 250 warble holes ; another contained 200 holes. It is estimated that 80 per cent. of the hides of cattle are damaged in this way, and also that 85 per cent. of the hides are cut or pierced by means of barbed wire. Both of these sources of mischief cause much distress to the animals and a great annual loss to farmers and the leather trade.

The Royal Agricultural Society has repeatedly drawn attention to the serious losses caused by warbled hides, and the exhibit was arranged at Derby with a view of bringing once more under the notice of farmers an evil which is largely preventable by the adoption of proper and well-concerted measures.[1]

Royal Agricultural Society of England.—No inconsiderable proportion of the Exhibition was devoted to the Society's own scientific departments. The various publications of the Society, including books, pamphlets, leaflets, diagrams, &c., were again exhibited and sold. Similar exhibits to those of previous years were sent by the Society's Botanical and Zoological departments, the former including a new large diagram illustrating the results of experiments on the germination of farm seeds. These are described in the Report of the Consulting Botanist at page 257 of this Volume.

The exhibits from the Society's Woburn Experimental Station comprised the illustration of several series of experiments by plants growing in pots, a number of diagrams and photographs having reference to the field experiments, and also specimens of corn and grass from various experimental plots.

Prominent among the pot cultures were those which showed how land, naturally poor in lime, could, after a period of continuous corn-growing and yearly manuring with ammonia salts, be rendered absolutely sterile for a crop of wheat or barley. The weed spurry (*Spergula arvensis*) was the only thing that would grow on this soil. By dressing the soil with lime the fertility could be restored; but it was shown that with barley an application of 1 ton of lime to the acre was not enough to destroy the spurry and to neutralise the acidity produced in the soil. When, however, the acid soil was sterilised by boiling it thoroughly with water, the acid constituents were removed, the spurry weed would no longer grow, and lime, then applied, was effective in restoring a full crop.

In another series of pot cultures the influence of lime and magnesia in varying relative proportions was shown. When the proportion of lime to magnesia in the soil was as 2 : 1, the wheat crop throve well; when, however, lime and magnesia were present in about equal proportions the crop was considerably reduced; and when magnesia was in excess of lime then the crop was almost a failure. This matter is, however, under further investigation, as the question would

[1] Journal R.A.S.E., Vol. 56, 1895, pp. lxxxi, lxxxii. See also Professor Penberthy's article on "Parasites" in the current Volume, pp. 65-67. A leaflet on "Warble Flies" is issued free of charge by the Board of Agriculture and Fisheries, 4 Whitehall Place, S.W.

seem to depend largely upon the amount of lime which is really available.

A further pot-culture experiment illustrated the beneficial action of phosphates in the case of a fen land soil (Cambridgeshire), and that lime was not in this instance needed, but phosphates instead.

The necessity of paying careful attention to details in the method of growing plants in pots was shown by the exhibition of crops grown in the same soil, but in the one case filled in more or less in a wet condition, and in the other in a dry state. The same soil was further used, but filled in in different ways, *e.g.*, with light and with heavy pressure respectively, and wet and dry, carefully and hap-hazard, the whole going to show that the results obtained in pot-culture work will depend greatly, for their value, upon the particular methods pursued, and that these can only be learned by experience.

The main points brought out by the continuous manuring of wheat and barley, and through the use or withholding of lime, as instanced in the Stackyard (Woburn) Field Experiments, were illustrated both by photographs and by diagrams.

A series of micro-photographs showed the appearances due to the presence of weed and other foreign seeds as met with in ordinary feeding materials such as linseed cake, bran, &c. Further, there were exhibited specimens of the roots of wheat and barley plants taken from plots on Stackyard Field, and which illustrated in very marked manner the influence which lime, or the withholding of it, had upon the development of the roots.

Lastly, some interesting specimens of turf were shown which had been recently cut from a field at New Hall Farm, Barnsley, Yorks., on which the Society had conducted its grass experiments. These demonstrated in a remarkable manner the great value of lime (on a soil poor in that constituent), an application of 4 tons of lime to the acre continuing to show wonderful benefit though the application had been made ten years previously. On this land basic slag was without effect.

Mr. H. M. Freear—Dr. Voelcker's assistant at the Woburn Pot-culture Station—was again in charge of these exhibits, for the purpose of explaining them to visitors.

II. NATURE STUDY IN RURAL SCHOOLS.

A novel feature and one that created much interest was a collection of exhibits illustrating the teaching of rural economy and the study of nature in public elementary and secondary schools. The department was organised by the Education Committee of the County Councils' Association, with the help of experts, including Mr. T. S. Dymond, of the

Board of Education, and the Rev. A. Thornley, Superintendent of Nature Study under the Nottinghamshire and Leicestershire Education Committees. The latter took personal charge of this section during the Show, and rendered valuable services by explaining to visitors the character of the work done and the educational objects sought to be attained. The counties from which exhibits were sent included Cambridge, Cumberland, Durham, Derby, Essex, Leicester, Lincoln, Nottingham, Stafford, Essex, and Worcester. In addition to specimens of exercise-books, diaries, note-books, calendars, and other teaching apparatus, there was a large variety of mounted specimens of natural objects, the work done revealing great intelligence and enthusiasm on the part of both teachers and pupils. The collections included local flowering plants, intended to familiarise pupils with the wild flowers of their districts and to develop taste and manipulative skill ; leaves facilitating the recognition of common trees (oak, ash, hazel, sycamore, beech, willow, guelder rose, hawthorn, &c.) ; fruits of wild flowers and of wind-fertilised flowers of trees ; fossils ; insect pests (black-currant gall-mite, click beetle and wireworms, aphis, cockchafer grubs, slugs, caterpillars, earwigs, &c.) ; specimens illustrating life-histories of insects and animals (wireworm, currant moth, frog, toad, &c.) ; and specimens illustrating the germination of seeds and the growth of plants. Some water-colour drawings made direct from nature of common subjects (apple blossom, blackthorn, geranium, flowering currant, &c.), were beautifully executed by elementary school children.

More advanced botanical studies are undertaken by pupils in secondary schools, and from these some excellent work was sent up by girls. They included collections illustrating the classification of local plants into flowers of the hedgerow, plants of a wood, water plants, &c., and studies of common trees (walnut, laburnum, &c.), showing seedlings, branches, buds, flowers, fruits, seeds in pods, opening of pods, and the wood in sections, with interior and exterior of bark, &c.

Within recent years, school gardens have become an important feature of rural elementary schools. The Staffordshire County Council undertook the illustration of this branch, and exhibited collections of tools, seeds, and apparatus as supplied to school gardens. They also displayed a map showing that in Staffordshire gardening classes are held in seventy-nine day schools, in thirty evening schools, and in two grammar schools.

It was probably a revelation to many of the visitors to the Derby Show that such important educational developments are taking place in our rural elementary and secondary schools under the fostering guidance of the Board of Education.

Agriculturists will note with satisfaction that teaching of this kind has an important bearing upon the future of their great industry.

III. BRITISH FORESTRY.

This department followed closely the lines of the Forestry Exhibitions of the two previous years at Park Royal. It was organised with the expert assistance of members of the Council of the Royal English Arboricultural Society. Mr. George Marshall again kindly undertook the personal superintendence of the staging of the exhibits, and rendered valuable assistance as Steward during the Show. It will be unnecessary to describe in detail the whole of the exhibits, as many of them have been referred to in previous Reports. Attention will therefore be mainly directed to the more novel of the exhibits at Derby.

Immediately in front of the Exhibition building, open ground space was devoted to choice forest and ornamental trees and shrubs from the nurseries of Messrs. Dicksons, Ltd., of Chester, Messrs. Fisher, Son & Sibray, Ltd., of Handsworth, Sheffield, and Messrs. Kent & Brydon, of Darlington. Messrs. Dickson sent a collection of conifers, and specimens of their new golden variety of the Cornish elm (*Ulmus cornubiensis Dicksonii*). The foliage is a fine bright gold, and the colour is stated to be retained until very late in the autumn, and not to burn in the sun. The collection of Messrs. Fisher, Son & Sibray consisted of hardy forest and ornamental trees, including a silver fir from the island of Saghalien, the giant gold and silver *Dimorphanthus* from Manchuria, and the Japanese umbrella pine (*Sciadopitys verticillata*). They showed also young oak, birch, sycamore, and other forest trees, lifted from the open ground, to illustrate the stout, sturdy growth of such trees when given more room in the nursery rows than is usually given in general cultivation. Messrs. Kent & Brydon sent a collection of choice shrubs for forest and estate planting.

The Duke of Northumberland sent exhibits illustrating technical points in forestry. An outside plot was occupied with young trees showing the German method of sylvicultural mixing, light-demanding and shade-bearing trees having each their proper positions. The number of trees per acre and the method of mixing may be varied according to circumstances; but in the scheme illustrated the total number of trees per acre would be 4,840, the mixture being as follows :—

(*a*) An outer row of beech for shelter.

(*b*) A second row containing a fair sprinkling of sycamore as a wind-resisting tree.

(*c*) Oak, 9 ft. apart, for the permanent crop.

(*d*) Other hardwood trees for returns during rotation.
(*e*) Sprinkling of larch for early returns.
(*f*) Shade-bearers, such as spruce, silver fir, and beech, for soil production and stimulation of the main crop.

Inside the building an exhibit illustrated the economic differences between dense and thin crops of trees. Thus, where only 2,722 trees per acre were planted four feet apart, there was not only less timber, but the numerous branches depreciated the value of the wood. A crop of 4,840 trees to the acre planted three feet apart gives a larger crop and also superior straight timber owing to the suppression of branches through density of growth, although the girth of the trees is somewhat less than the girth of trees planted wider apart.

Another example from Alnwick illustrated cases of severe pruning. The cuts would be dressed with a mixture of one gallon of tar and about one quart of paraffin oil.

The evil effect of not pruning close to the stem was shown by a specimen. In this case decay had set in down the stem. When live boughs are cut close to the stem, healing takes place before the decay sets in. In plantations of conifers, when left alone, the natural pruning caused by thick planting takes place.

A portion of a stem taken from the centre of a poor Scotch fir wood, seventy years old, showed the effects of thinning too early. The clean portion at the base of the trunk was due to the original thick planting, and the thick branches at the top appeared in consequence of the plantation, when young, having been thinned too soon. The commercial value of the crop had therefore been greatly depreciated in consequence of this mistake.

On the other hand, a section of a spruce tree illustrated the advantage of deferred thinning. The section was taken from a portion of a forty-five-year-old pure wood containing 632 trees to the acre, with cubic contents (true measure) of 6,000 ft. The section was taken ten feet from the base ; the total height of the tree was fifty-three feet and the cubic contents were ten feet. The increment amounts to $133\frac{1}{3}$ cubic feet per annum. The average increment of the whole wood—about 100 acres on moorland peaty soil—is over 100 cubic feet per acre per annum. It is therefore a very valuable crop for estate purposes.

The Royal Agricultural College also showed specimens illustrating the evil effect of natural or incorrect pruning, the results of both being similar. Healing by occlusion is rendered impossible by the presence of the stump, which, as it dies, serves as a channel for the conveyance of water to the trunk. In a specimen shown, decay had already set in, and the planks when sawn out would be blemished.

The Earl of Egmont sent a collection of ash plants, showing the growth of ash for walking sticks, and five samples of wood hoops, the manufacture of which is an industry in Surrey, Sussex, and Hants. These hoops, which are used for binding barrels, are made from the underwood of chestnut, ash, hazel, and birch. Another exhibit showed the rapid growth of the shoots from the stool after cutting, the increase being at the rate of eight feet in one year.

Captain Ord Capper sent specimens showing the difference between larches grown as solitary trees and those crowded in a wood; also the diseased branches of a forty-year-old conifer, *Picea nobilis*. Lady Amabel Kerr showed a magnificent plank from a Scotch fir, grown at Melbourne Hall, near Derby, which was much admired. Lord Egerton of Tatton sent the polished planks of different British timbers as in previous years. Lord Yarborough also exhibited, as before, a large and varied assortment of timbers, creosoted specimens, photographs, &c., and in addition his lordship showed some massive garden seats made from peeled oak branches and a garden seat formed by cutting partly down the trunk of a tree.

Messrs. Remer & Co., Ltd., of Derby Road, Liverpool, exhibited interesting specimens of home-grown hardwoods, compared with specimens of similar woods grown in the colonies and in the United States.

Forestry photographs were exhibited by His Majesty's Commissioners of Woods and Forests, the Royal Agricultural College, Professor W. R. Fisher, and Messrs. Richardson & Son, Stamford.

The Surveyors' Institution sent museum specimens, and the Country Gentlemen's Association, Ltd., tree seeds and seedlings. Messrs. Herd Bros., of Penrith, also exhibited seedlings and young transplanted living forest trees.

The section devoted to insects, diseases affecting trees, and the attacks of game, birds, squirrels, voles, &c. was again well filled.

Mr. A. T. Gillanders (forester to the Duke of Northumberland) and Mr W. B. Havelock (forester to the Earl of Yarborough) rendered valuable services by explaining the exhibits to visitors interested in forestry.

ERNEST H. GODFREY.

Woodford,
Harpenden, Herts.

REPORT OF THE COUNCIL TO THE ANNUAL GENERAL MEETING OF GOVERNORS AND MEMBERS OF THE SOCIETY,

HELD AT THE HOTEL RUSSELL,

On WEDNESDAY, December 12, 1906, *at* 12.30 *p.m.*

MR. F. S. W. CORNWALLIS (President) in the Chair.

1. The Council beg to present to the Governors and Members of the Society the following Report of their transactions during the past year.

2. The following changes in the list of Governors and Members have taken place :—85 Governors and 888 Members have been elected, and 4 Members have been reinstated under Bye-law 12 ; whilst the deaths of 5 Governors, 73 Life Members, 98 Annual Members, and 3 Honorary Members have been reported. A total of 2 Governors and 250 Members have resigned ; whilst 27 have been struck off the books under Bye-law 10, owing to absence of addresses, and 30 under Bye-law 11, for arrears of subscriptions.

3. The above and other changes bring the total number of Governors and Members now on the Register to 9,620, divided as follows :—

1 Foundation Life Governor ;
154 Annual Governors ;
92 Life Governors ;
6,196 Annual Members ;
3,147 Life Members ;
30 Honorary Members.

9,620 Total number of Governors and Members, as against a total of 9,170 Members on the Register on December 31, 1905.

4. The Council regret to have to record the deaths of two of their number : Mr. Howard P. Ryland, of Moxhull Park, Warwickshire, and Mr. J. P. Cross, of Catthorpe Towers, Rugby. Mr. Ryland had been a most active Member of Council since the year 1894, and had rendered great services on several of the Committees, as Steward of Implements and Live Stock, and also as Steward of Forage in 1898, when the Society's Show was at Four Oaks, Birmingham. Mr. Ryland's great interest in everything affecting the well-being of the Society was maintained until almost the day of his death. Mr. Cross had been a Member of the Society since the year 1881, and was elected a Member of Council in July, 1905. Two vacancies on the Council have arisen in consequence of the resignations of the representatives

of the divisions of Lincolnshire (Mr. William Frankish) and Scotland (Sir John Gilmour, Bart.). Mr. Frankish had been a Member of Council for the exceptionally long period of thirty years, having been elected in 1875. He was an active Member of several of the most important Committees, the meetings of which he had attended with unfailing regularity during the whole of the time he was a Member of the Council. As Chairman of the Implement Committee, as a Steward of Finance, and as Steward of other departments of the Show, Mr. Frankish's services have been of the greatest value to the Society. Sir John Gilmour was elected a Member of Council in July, 1905, but in consequence of circumstances having arisen which prevented his attendance at the Monthly Meetings of the Council, he felt it necessary to tender his resignation.

5. The death has also to be recorded of Professor Sir George Brown, the Society's Senior Consulting Veterinary Surgeon, who had been an ordinary Member of the Society since the year 1862, and was elected an Honorary Member on April 1, 1878. Sir George Brown had for many years been closely identified with the Society as Veterinary Inspector at the Annual Shows, and in connection with the work of the Veterinary Committee. The Society is greatly indebted to him for his valuable papers on the diseases of the Animals of the Farm, several of which have been issued in pamphlet form. The Council also regret to have to record the death of Mr. A. C. Cope, who had been a professional Member of the Veterinary Committee since 1901, in which year he was also elected an Honorary Member.

6. Amongst other Governors and Members, whose loss by death during the present year the Society has to deplore, are: The Duke of Rutland, K.G., the Earl of Ilchester, Viscount Hampden, Lord Clinton, Lord Glanusk, Lord Templemore, the Right Hon. A. F. Jeffreys, M.P., Sir Wilfrid Lawson, Bart., M.P., Sir Thomas Brocklebank, Bart., Sir R. D. FitzHerbert, Bart., Sir B. Henniker, Bart., Sir W. T. Makins, Bart., Sir Pryse Pryse, Bart., Sir C. H. Rouse-Boughton, Bart., Sir Sidney Waterlow, Bart., K.C.V.O., Sir Henry Wiggin, Bart., Sir John Dunne, K.C.B., Sir William Pink, Sir Richard Tangye, Dr. W. Fream (Editor of the Society's Journal from 1890 to 1900, and author of the Society's Text Book, "Elements of Agriculture"), Mr. A. Dudley Clarke, Mr. Thomas Arkell (a Member since 1843), Mr. Edmund Backhouse (a Member since 1846), Mr. George Bagnall, Mr. John Barron, Major Best, Mr. Charles Burrell (a Member since 1848), Mr. Henry Denis de Vitré, Mr. A. F. Milton Druce, Mr. Henry D. Marshall (a Member of the Council from 1897 to 1905), Lt.-Col. G. Herbert Morrell, the Rev. S. H. Powell (a Member since 1842), Mr. F. Punchard,

Mr. R. A. H. Seymour, Mr. A. C. Skinner, Mr. William C. Watson, Mr. Jonas Webb, and Col. R. Worsley Worswick.

7. The Earl of Northbrook has been elected a Vice-President of the Society in the place of the late Sir Jacob Wilson. To fill vacancies which have occurred in the list of ordinary Members of Council, the following have been elected :— Mr. James Falconer, of Northbrook Farm, Micheldever, Hants ; Mr. Henry Dudding, of Riby Grove, Stallingborough, Lincolnshire ; Mr. James W. Glover, of Warwick ; Sir Humphrey F. de Trafford, Bart., of Hill Crest, Market Harborough, Leicestershire ; and Mr. Thomas A. Buttar, of Corston, Coupar Angus, Scotland.

8. The Council, at their last Meeting, received with extreme regret from Sir Nigel Kingscote an intimation that, by his doctor's orders, he would be compelled to forego active work on the Council of the Society, and must therefore resign the Trusteeship which he had held so long. On the motion of the President, seconded by H.R.H. Prince Christian, the following resolution was unanimously adopted by the Council :—

> "The Council desire to record on their minutes the great regret with which they learn that Sir Nigel Kingscote is compelled by ill-health to retire from the deliberations of the Council. Since his election to the Council in 1863, he has served as President of the Society in 1877-1878, as Chairman of the Finance Committee from 1875, and Chairman of the House Committee from the same date. He frequently acted as Steward at the Annual Shows, and has been a Trustee of the Society from 1874. In these and other offices, and on all occasions, his energy, tact, and earnestness have been of inestimable value to the Society, while his courtesy and kindness have endeared him in a special degree to all his colleagues."

To fill the vacancy caused by the resignation of Sir Nigel Kingscote, the Council, at their Meeting held on Wednesday, November 7, unanimously elected Mr. F. S. W. Cornwallis a Trustee of the Society.

9. To meet a frequently expressed desire, steps were taken in the year 1904 to obtain such an alteration of the Society's original Charter of March 26, 1840, as would enable the Society to re-arrange its system of electing the Council with a view to placing it on a more representative basis. To give effect to this object, His Majesty The King was graciously pleased to grant to the Society a Supplemental Charter, under which the ordinary Members of the Council, instead of being elected at General Meetings of the Society by the votes of those present are now "elected by divisions of the Society comprising the Governors and Members resident in electoral districts."

10. The new Bye-laws governing the election of the Council, the procedure at General Meetings, and other kindred matters, were sanctioned at an Extraordinary General Meeting held after the conclusion of the business of the Anniversary General

Meeting on May 22 of last year, and were enacted at the Council Meeting which took place on May 31, 1905. Under these new Bye-laws, each County in England is constituted a "division" or electoral district, with the addition of three "divisions" for Wales, one "division" for Scotland, and one "division" for Ireland (Bye-law 78). A County or "division" comprising less than 300 Governors and Members returns one ordinary Member of the Council by the votes of the Governors and Members residing therein. A County having 300 or more Members resident therein returns two Councillors, with an additional Councillor for every additional 200 Governors and Members (Bye-law 79).

11. The first election of ordinary Members of Council under the Supplemental Charter, took place during the month of July, 1905, and the results of such election were reported to the General Meeting on August 1, 1905, in order that the Meeting might, in accordance with Bye-law 74, "take cognisance of the election of ordinary Members of the Council in place of those vacating office." There were 48 divisions entitled, under the new system, to elect ordinary Members of the Council, 43 of these sending up one Member, 4 two Members, and 1 (London) three Members; total, fifty-four Members of Council. From four constituencies—Cornwall, Dorset, Essex and South Wales—no effective nominations had been received at the time of the General Meeting last year, and consequently, only 50 Members of the new Council were elected. Of these, 26 were Members of the old Council. In 29 of the 44 divisions of the Society who had sent these 50 gentlemen to represent them, there was never more than one candidate nominated, and the provisions of Bye-law 84 therefore applied. In each of four other districts there was originally one more candidate than there were vacancies to be filled, but one retired before the day of polling arrived. In the remaining 11 districts there were contested elections, which were conducted by voting papers issued in accordance with Bye-law 85. Immediately after the General Meeting nomination papers were again sent out to the Members resident in Cornwall, Dorset, Essex and South Wales, and the vacancies were duly filled up, after contested elections in the three last-named Divisions.

12. Under Bye-law 82, the whole of the new Council elected last year retain office until the forthcoming Annual General Meeting on December 12, 1906, when "the Member or Members elected by each of the Divisions in such one of the Groups of Divisions marked 'A,' 'B' and 'C' respectively as shall be determined by the Council (by ballot or otherwise) shall retire." A second Group shall retire at the Annual General Meeting

in December, 1907, and the remaining Group at the Annual General Meeting in December, 1908. The Council have accordingly determined by ballot that the representatives of the various Divisions shall retire in the following order :—

In 1906:—Group "C," comprising the Divisions of Cumberland, Westmorland, Yorks. (East Riding), North Wales, Lincoln, Huntingdon, Cambridge, Oxford, Kent, Warwick, Gloucester, Glamorgan, Somerset, Berkshire, Sussex, and Ireland.

In 1907:—Group "B," comprising the Divisions of Durham, Yorks. (West Riding), Nottingham, Leicester, Rutland, Suffolk, Buckingham, Essex, London, Shropshire, Hereford, South Wales, Devon, Wiltshire, and Surrey.

In 1908:—Group "A," comprising the Divisions of Northumberland, Yorks. (North Riding), Lancashire (and Isle of Man), Cheshire, Derby, Northampton, Norfolk, Bedford, Hertford, Middlesex, Stafford, Worcester, Monmouth, Cornwall, Dorset, Hampshire and Channel Islands, and Scotland.

The results of the Election of Members to represent the Divisions in Group "C" will be announced by the President, in accordance with Bye-law 86, to the Annual General Meeting on December 12.

13. At the first meeting of the newly-elected Council, held on August 1, 1905, the following Resolution was passed :—

"That a Special Committee be appointed, with power to call for any information from officials, and to employ professional assistance, if they consider it necessary, from accountants, solicitors, and valuers, to thoroughly investigate the entire position of the Society, and to make a report to the Council after the recess as to what reforms and economies they consider desirable to put the Society on a sound footing."

This Committee was constituted as follows :—The President (Mr. Cornwallis), Mr. T. L. Aveling, Mr. Richardson Carr, Sir R. P. Cooper, Bart., Mr. R. Forrest, Sir John Gilmour, Bart., Sir Gilbert Greenall, Bart., Mr. W. Harrison, the Earl of Jersey, Mr. Christopher Middleton, Mr. T. S. Minton, Mr. F. Reynard, Mr. John Rowell, Mr. E. W. Stanyforth, Mr. Richard Stratton, Mr. George Taylor, Mr. John Thornton, and Mr. C. W. Wilson.

14. The Special Committee met on September 20 and 21, 1905, and prepared the following Report,[1] which was submitted to the Council on October 4, 1905 :—

1. In accordance with the Resolution of the Council of August 1, 1905, your Committee met on September 20 and 21, and beg to report on the reforms and economies they consider desirable to place the Society on a sound footing.

2. The Committee desire to express their recognition of the services of the Staff in the past; but in view of the financial position of the Society they are unable to recommend a continuance of so large an expenditure as is at present incurred under this head, and regret that they see no other course open to them but to request the Council to ask for the resignation of the whole Staff as at present engaged at Hanover Square and Park Royal.

[1] The Earl of Jersey and Mr. E. W. Stanyforth were unable to be present at the Meetings of the Committee and did not sign the Report.

3. They consider that a sum not exceeding 1,500*l.* per annum is all that the Society is at present justified in expending on the salaries of the Secretary and administrative Staff.

4. They recommend that a Secretary (to devote his whole time to the work of the Society) should be appointed at a salary of 600*l.* per annum, and an assistant at 300*l.* per annum.

5. HAREWOOD HOUSE.—They recommend that if a satisfactory price can be obtained for Harewood House, it shall be sold at as early a date as possible, and failing this, that such part of the house not absolutely required for the purposes of the Society shall be let.

6. JOURNAL.—They recommend that the cost of the Journal, including distribution, shall not exceed 600*l.* per annum.

7. SCIENTIFIC DEPARTMENTS.—They recommend that the Board of Agriculture be approached with a view to obtain a grant in aid of the scientific operations of the Society, which must otherwise be curtailed, unless such assistance can be obtained.

8. THE SOCIETY'S SHOW.—They recommend that no Show be held at Park Royal in 1906, but that it take place in the provinces if a suitable site can be obtained and financial arrangements made; also that a sum of not less than 2,000*l.* from the Governors' and Members' subscriptions be credited to the expenses of the annual Show.

9. They think it would be most advantageous that a conference be held annually between the Council and Officers of the Royal Agricultural Society and the Secretaries of the County, Breed, and other leading Agricultural Societies to consider questions of general and mutual interest.

10. PARK ROYAL.—They recommend that immediate steps be taken for the disposal of the Society's interest in the Park Royal Estate.

11. SUBSCRIPTIONS.—The Committee desire to draw attention to and emphasise the desirability of encouraging Members to give financial support to the Society beyond the minimum subscription.

15. With the exception of paragraph 10, which was remitted to the Special Committee for further consideration, the Report was adopted, paragraphs 2, 3, 4, and 11 being referred to the Finance Committee, 5 to the House Committee, 6 to the Journal Committee, 7 to the Chemical, Botanical, and Education Committees, and 8 to the Special Committee to deal with.

16. The Finance Committee, reporting to the Council on November 1, 1905, with reference to paragraphs 2, 3, and 4 of the Special Committee's Report, considered that the new arrangements for the administration of the Society's affairs proposed by the Special Committee would be best facilitated by bringing to a termination the existing engagements of the whole of the Staff. This recommendation was adopted, and the decision of the Council was, in due course, communicated by the President to each officer and clerk, with an expression of the Council's satisfaction with, and appreciation of, his past services to the Society. The Secretary expressed his willingness to retire at once, on the understanding that he received what was legally due to him as regards remuneration. In view of Sir Ernest Clarke's long association of 18½ years with the Society as its Secretary, the Finance Committee unanimously recommended to the Council that his tenure of office should

be considered as terminated at Christmas, 1905, and that he should receive at that time, in lieu of further salary, the sum of 1,000*l.* in full discharge of all pecuniary claims upon the Society. This recommendation was endorsed by the Council, who, in recognition of the services which Sir Ernest Clarke had rendered, unanimously elected him an Honorary Member of the Society.

17. In order that the selection of the new Secretary might be expedited, a form of application for the post was drawn up on October 17, 1905, and the appointment was ordered to be advertised forthwith. Subsequently, on December 6, 1905, the Finance Committee submitted the names of three candidates for the consideration of the Council, including that of Mr. Thomas McRow, who, on their recommendation, was unanimously appointed Secretary of the Society. Arrangements have been made for carrying out the Special Committee's recommendation as to the salaries of the Secretary and Administrative Staff.

18. With regard to Harewood House (paragragh 5 of the Special Committee's Report), the Council endeavoured to make such arrangements as would enable the several Breed Societies now located at No. 12 Hanover Square to be accommodated in Harewood House ; but, unfortunately, after conference with representatives of the various Societies, the proposed arrangements were considered to be impracticable. The Council then gave consideration to an offer which had been submitted by their Agents for letting the premises on a Building Lease for ninety-nine years from Michaelmas, 1905, at 1,000*l.* for first year, and 2,000*l.* per annum afterwards, with option of purchase within two years at 50,000*l.* Instructions were given to the Society's Solicitors to carry through the necessary negotiations for the granting of the lease, and in due course a draft Building Agreement was submitted to the prospective lessees, who eventually returned the document stating that for certain reasons they were not prepared to continue the negotiations, and that their offer therefore must be considered as withdrawn. The Council greatly regret the failure of the negotiations ; but they are able to report that their Agents are in treaty with a likely purchaser.

19. In view of the possibility of Harewood House being disposed of it was thought desirable to obtain other offices for the Society, so that Harewood House could be vacated at Michaelmas. Arrangements were accordingly made for securing the lease of No. 16 Bedford Square for a term of thirty years, and the offices were transferred to this address on September 29, 1906. The accommodation in the new premises, including a "Members' Room," will be found to be ample, and the Council

Chamber, now in course of erection at the rear of the House, will be sufficiently commodious for any meetings the Society may have to hold.

20. The recommendation of the Special Committee with regard to the Society's Journal (paragraph 6) has already been carried out in connection with Volume 66, issued at the beginning of the present year. As the Members of the Society will be aware, it was found necessary, in order that the Journal might be produced at a cost of 600*l.*, to reduce the number of pages and to revert to the use of the blue paper covers. The Council have engaged Mr. Ernest H. Godfrey to undertake the work of editing Volume 67 of the Journal, now in course of preparation.

21. In view of the recommendation of the Special Committee (paragraph 7) that the Board of Agriculture should be approached with the object of obtaining a grant in aid of the scientific operations of the Society, the matter was considered by the various Committees concerned, and, subsequently, the President and the Chairmen of those Committees held a conference, when it was agreed to suggest to the Council that a Deputation should be appointed to wait upon the President of the Board of Agriculture in support of a strong appeal from the Society for a Government Grant in aid of the Education and Scientific Branches of the Society's work. This course was agreed to by the Council, and on December 6, 1905, the Deputation was received by Sir Thomas Elliott, Secretary of the Board; but the Government did not see their way to give the assistance asked for.

22. A proposal was made by the Board of Agriculture to form a National Council of Agricultural Research, with the object of co-ordinating the work of agricultural experiment throughout the country. In this scheme the Royal Agricultural Society, with other bodies, were asked to co-operate, but, while giving a general approval to the objects of the scheme, the Society, as regards their own work, felt that for its proper conduct and support in the future, a more definite promise of financial support was needed than the scheme foreshadowed. The matter therefore remains in abeyance.

23. Arrangements have been made by the Council to call a Conference of Secretaries of the principal Agricultural and Breed Societies in the country, as suggested in paragraph 9 of the Special Committee's Report, for the purpose of discussing matters of mutual interest.

24. With regard to the paragraph in their Report, "that immediate steps be taken for the disposal of the Society's interest in the Park Royal Estate," the Special Committee, after further considering the matter, adhered to their previous

recommendation. They were of opinion that the Society would not be justified in incurring the large annual expense for interest, upkeep, &c., which would be necessary if Park Royal were retained in the Society's possession until the pre-emption period expired at the end of 1911; and they recommended, therefore, that the Council should forthwith instruct the Directors of Park Royal, Limited, to offer the property to the original vendors at the price of 375*l.* per acre, stipulated in clause 14 of the agreement of purchase dated September 30, 1901. This recommendation was adopted by the Council at their meeting on November 1, 1905.

25. The property was thereupon offered to the original vendors, who declined to exercise their right of pre-emption. The Directors of Park Royal, Limited, then placed the estate in the hands of a firm of Auctioneers, and the property was offered for sale by auction at The Mart, Tokenhouse Yard, E.C., on May 22 last. As, however, the "reserve" price was not reached, the property was withdrawn; but the Council are pleased to report that it has since been disposed of for the sum of 28,500*l.*

26. The Bye-laws enacted under the Supplemental Charter require that the Annual General Meeting for the year 1906 and every subsequent year shall be held in the month of December, and that at each Annual General Meeting the balance-sheet and the reports of the Council and of the Auditors shall be submitted for consideration. The Council, therefore, beg to submit the balance-sheet for the year 1905, with the two Statements of (*a*) Ordinary Income and Expenditure, and (*b*) Receipts and Expenditure of the Show at Park Royal. These accounts were published in Volume 66 of the Journal issued to Members last March, having been duly examined and certified as correct by the Auditors appointed by the Members, and by the professional Accountants employed by the Society. The general result of the working of the year 1905 was a deficiency of 2,370*l.* 9*s.* 1*d.*, made up as follows:—

	£	*s.*	*d.*
Excess of Ordinary Expenditure over Income . .	1,484	2	5
Deficiency on Show at Park Royal . £7,467 19 11			
Less Special Donations . . 7,038 12 0			
	429	7	11
Depreciation of Fixtures, &c.	456	18	9
	£2,370	9	1

27. Additional subscriptions amounting to 558*l.* 16*s.*, and donations amounting to 1,041*l.* 5*s.* 6*d.*, have been received from existing Members of the Society, in addition to their previous Subscriptions, particulars of which will be found in the list

of Increased Subscriptions and Donations appended to this Report. [See Appendix, page xiii.]

28. A cordial invitation was received from the Mayor and Corporation of Derby to hold the Show of 1906 in that town, an eligible site for the Showyard having been placed at the disposal of the Local Authorities by the Midland Railway Company. This invitation the Council decided unanimously to accept, their decision being greatly influenced by the guarantee which had been so generously given by a Member of the Council, under which he was prepared to make good any loss which might result from the Derby Show. In connection with this year's Exhibition, the Derbyshire Agricultural Society co-operated most heartily and decided to suspend its own Show in favour of the "Royal." The Council thereupon resolved that every Member of the Derbyshire Society should be granted the same privileges in connection with the Show as were enjoyed by Members of the Royal Agricultural Society. The total amount of the Prizes offered was 6,868*l.*, of which sum 797*l.* was contributed by the Derby Local Committee, and 2,070*l.* by the various Breed Societies. The Local Classes of the Derbyshire Agricultural Society were exhibited in the Showyard for one day only, on Friday, June 29. Butter-making Competitions were held in the Society's Dairy on Thursday, June 28, and Saturday, June 30, for residents in Derbyshire who had been pupils of the Travelling Dairy School in Nottinghamshire or Derbyshire, or of the Midland Agricultural and Dairy College. The Horticultural Display in the Special Tent was most attractive. The space available for the purposes of the Show was fully utilised; the number of feet of Shedding allotted in the Implement Department was 13,000, in addition to a large number of Open Space Exhibits. The entries of Live Stock numbered 2,319, and were above the average,

29. An interesting feature of the recent Show was the trial of Suction Gas Plants. Fourteen plants were entered for competition by twelve firms, and, as the result, the Society's Gold Medal was awarded to the National Gas Engine Company, Ltd., Wellington Works, Ashton-under-Lyne, for their 20-B.H.P. National Gas Engine with 20-B.H.P. National Suction Gas Plant; and the Silver Medal to Messrs. Crossley Bros., Ltd., Openshaw, Manchester, for their 15-B.H.P. Gas Engine and 15-B.H.P. Suction Gas Producer. The official Report on these trials is now in the press and will shortly be published.

30. His Majesty The King, accompanied by His Grace the Duke of Devonshire, honoured the Society by visiting the Show on Thursday, June 28, and was received in the Showyard by H.R.H. Prince Christian of Schleswig-Holstein, the

President (Mr. Cornwallis), the Honorary Director (Sir Gilbert Greenall), the Stewards and other Members of Council. On arriving at the Royal Pavilion, His Majesty inspected the Crimean veterans of the Notts. and Derby Regiment, who had been drawn up in front of the Pavilion, under the command of Colonel Gascoigne, and afterwards visited the various departments of the Showyard. In spite of the inclement weather on the day of His Majesty's visit the attendances were remarkable, the number of persons paying for admission (2*s.* 6*d.*) being 25,666.

31. The hospitality of the town and county of Derby was worthily sustained by the Mayor and other residents in the town and throughout the county. A pleasing feature of the Meeting was the cordial co-operation of the Members of the Local Committee with the Society's officials in all their endeavours to make the Show of 1906 a great success.

32. Formerly, the Showyard has been erected by the Society's own officials, but on this occasion the Council decided to employ a contractor to carry out the work. Tenders were invited and the work was entrusted to Messrs. E. Wood & Sons, of Derby, who carried out their contract satisfactorily. The Council have arranged for this firm to erect the Showyard at Lincoln next year, at considerably reduced prices.

33. A statement of the Receipts and Expenditure in connection with the Show will be presented to the General Meeting on December 12. It is estimated that the balance in the Society's favour will approximate the sum of 2,000*l.* The Council desire to congratulate the Members on the great success which has attended the Show on its return to the country, under the management of the Honorary Director, Sir Gilbert Greenall.

34. Invitations for the Show of 1907 having been received from Ipswich and Lincoln, a Committee was appointed to inspect and report upon the sites and other accommodation offered by the two localities. Deputations from these two places attended the meeting of the Council on August 1 last, and, in each case, the Mayor tendered a very cordial invitation to the Society. The Council, after having considered the Report of the Committee, decided to hold their Sixty-Eighth Annual Show at Lincoln in 1907.

35. The Show will open on the morning of Tuesday, June 25, and close on Saturday, June 29. The prices of admission will be as follows:—Tuesday, June 25, Five Shillings; Wednesday and Thursday, June 26 and 27, Half a Crown; and Friday and Saturday, June 28 and 29, One Shilling.

36. The Prize Sheet for the Lincoln Show is now under the consideration of the Council, who wish to take this opportunity

of acknowledging the very handsome contributions to the Prize fund which have been promised by the Lincoln Local Committee, the Lincolnshire Agricultural Society, and the various Breed Societies.

37. The entry fees for Horses have been revised, and in future will include all charges for stabling :—

	Members	Non-Members
For stallions and brood mares	40*s.*	80*s.*
For stallions and brood mares, post entries	50*s.*	100*s.*
For other horses in breeding classes	30*s.*	60*s.*
For other horses in breeding classes, post entries	40*s.*	80*s.*
Riding and driving classes	30*s.*	60*s.*
Pace and action and jumping classes	30*s.*	30*s.*

The fees for Cattle, Sheep, Pigs, Poultry, and Produce will remain as before.

The dates of Closing of Entries will be as follows :—

Horses, cattle, sheep, and pigs :—	
At ordinary rates	May 14
At post entry rates	May 28
Riding, driving, pace and action, and jumping classes	May 28
Poultry at ordinary rates	May 28
Produce at ordinary rates	May 14
Produce at post entry rates (except cider and perry)	May 28

38. Prizes amounting to 300*l.* have been accepted by the Council for Farm Prize Competitions in the following four Classes, open to *bonâ fide* Tenant Farmers :—

Class I.—For the best-managed Arable and Grass Farm, in the County of Lincoln, exceeding 300 acres. First Prize, 60*l.* Second Prize, 30*l.*

Class II.—For the best-managed Arable and Grass Farm, in the County of Lincoln, over 50 acres, and not exceeding 300 acres. First Prize, 35*l.* Second Prize, 25*l.*

Class III.—For the best-managed Arable and Grass Farm, regularly hunted over by the Belvoir, Blankney, Brocklesby, Burton, or Southwold Hounds, exceeding 300 acres. First Prize, 30*l.* Second Prize, 25*l.* Third Prize, 20*l.*

Class IV.—For the best-managed Arable and Grass Farm, regularly hunted over by the Belvoir, Blankney, Brocklesby, Burton, or Southwold Hounds, over 50 acres, and not exceeding 300 acres. First Prize, 25*l.* Second Prize, 20*l.* Third Prize, 15*l.* Fourth Prize, 15*l.*

Entries close on Monday, December 31, 1906. Applications for forms should be addressed to the Secretary of the Society, at 16 Bedford Square, W.C. There will be no entry fees for these Competitions.

39. Trials of Swath Turners and Side Delivery Rakes will be held in connection with the Lincoln Show, for which the Society's Medals in silver and bronze will be offered as prizes. The Regulations for these Trials have been issued.

40. The Consulting Chemist reported in May, 1905, that up to that time (five months) 293 samples had been submitted by Members to him for analysis. This number was increased

to 571 for the whole twelve months of 1905, the total being 41 in excess of the number analysed in 1904. For the eleven months subsequently the number of samples has been 507. For the Derby Show, analyses of selected samples of Cider and Perry were made at the Society's laboratory, and also a large number of milk analyses in connection with the awards in the milk trials.

41. The Woburn Field Experiments continue to show very interesting results, and the Farm has been visited by a larger number of people than in previous years. The effects of the use of lime on this soil are, in particular, very forcibly illustrated. Trials of different varieties of Clover and Lucerne have also been undertaken. As with the harvest of 1906 thirty years' work has been completed, the occasion is thought opportune for the modification, in some way, of the Continuous Wheat and Barley experiments, with the view of making them simpler and bringing them more into line with practical farming. At the Pot-Culture Station, the Hills' Experiments have been carried a stage further, and other experiments on inoculation for leguminous crops have been undertaken for the Board of Agriculture. An exhibit illustrating some of the principal features brought out in the Woburn Field Experiments was sent to the Milan Exhibition, for which the Society was awarded a Grand Prix. Illustrative specimens from the Pot-Culture Station were also exhibited in the Agricultural Education section of the Derby Show.

42. Since the last Annual Report of the Consulting Botanist there have been 206 inquiries dealt with from Members of the Society. The dry season has been unfavourable to the growth of parasitic fungi; only twenty-two cases of plants injured by these parasites have been investigated. The quality of seeds both as to purity and germination has been satisfactory, though one sample of broccoli seed consisted of only dead seeds, and the seeds of Wavy Hair Grass (*Aira flexuosa* Linn.), which is but a weed in good pastures, were offered to a Member for Golden Oat Grass. Farmers continue to suffer seriously from purchasing mixtures for pasture which are too frequently the medium for introducing worthless grasses and injurious weeds.

43. From the applications received by the Zoologist during the past six months, most of the ordinary pests would appear to have been particularly active, but not many of the cases in which advice was sought were of an unusual character. Among fruit pests the continued extension of the ravages of the Pear midge is to be noted, and a bad case of attack by the currant bud moth (*Incurvaria capitella*) occurred, which was utilised to advance to some extent our knowledge of the life-history

of this insect. In view of recent discoveries concerning the transmission of various diseases to domestic animals by their external parasites, the study of these parasites, hitherto too much neglected, has become of extreme importance, and the Zoologist considered it advisable to comply with a request received from the Government Entomologist of India to examine a large number of ticks collected from cattle, sheep, horses, and dogs from various parts of that country with a view to their identification. The study of this collection, and of very many ticks from various other parts of the world, has occupied much time during the past summer.

44. The President and other Members of the Council joined the Deputation organised by the Central and Associated Chambers of Agriculture, who waited upon the President of the Board of Agriculture on March 6, 1906, for the purpose of urging the necessity of keeping the present restrictions in force with regard to the importation of live cattle from abroad. Mr. Cornwallis expressed the views of the Society in support of the important object of the Deputation ; and his representations met with a sympathetic reply from the President of the Board of Agriculture, and may be presumed to have had some influence with the Government. The fact that the restrictions have been allowed to remain in force is a matter of satisfaction to agriculturists in general.

45. During the period which has elapsed since the date of the last Report, the scheduled contagious diseases of animals, with one exception, viz., sheep scab, have not been materially reduced in prevalence. The number of cases of anthrax and glanders reported have been nearly up to the average of the preceding twelve months, and the outbreaks of swine fever have become more frequent since the beginning of the year. Throughout the whole of last year there was a marked reduction in the prevalence of sheep scab as indicated by the number of outbreaks reported, and the decline which was then begun continues up to the present time.

46. As the result of this year's examination of students of the Royal Veterinary College in Cattle Pathology, including the diseases of Cattle, Sheep and Pigs, Mr. A. W. Noel Pillers, of the Royal Veterinary College, Camden Town, N.W., has been awarded the Society's silver medal, and Mr. A. Leslie Sheather, of 42 Compayne Gardens, Hampstead, N.W., the bronze medal.

47. An Agricultural Education Exhibition on similar lines to that arranged at Park Royal was organised in connection with this year's Show at Derby, exhibits being sent by the Lawes Agricultural Trust, the Cambridge University Agricultural Department, the Royal Agricultural College,

Cirencester, the South-Eastern Agricultural College, the Midland Agricultural and Dairy College, the Agricultural Education Association, the County Councils' Association, and the National Fruit and Cider Institute. Specimens and diagrams from the Society's Experimental Farm and Pot-culture Station at Woburn and from the Botanical and Zoological Departments were also shown at this exhibition. The latest developments of Agricultural Science and their practical results were illustrated in a complete and interesting manner, whilst the personal explanation by experts enabled a large number of daily visitors to study the exhibits with intelligence and profit. The Forestry Exhibition, located within and adjoining the same building, was arranged and supervised by Mr. George Marshall and Members of the Council of the Royal English Arboricultural Society, who attended each day during the Show for the purpose of explaining to visitors the technical significance of the exhibits.

48. The seventh annual examination for the National Diploma in Agriculture was held at Leeds, from May 7-10, 1906, when the following 28 candidates were awarded the Diploma, the first six gaining honours :—

Diploma with Honours.

1. Ernest Harrison, Harris Institute, Preston (*Gold Medal*).
2. John Fisher, Harris Institute, Preston.
3. James Wyllie, Glasgow and West of Scotland Agricultural College.
4. James Ryding Bond, Harris Institute, Preston.
5. Thomas Rimmer, Harris Institute, Preston.
6. Percy Snowdon, Leeds University.

Diploma.

7. Gwilym Williams, University College of Wales, Aberystwyth.
8. James Johnston, Glasgow and West of Scotland Agricultural College.
9. Oliver Cyril Spencer Watson, Harper-Adams Agricultural College.
10. Frank Atkinson Capstick, Harper-Adams Agricultural College.
11. Robert William Staniforth, Harris Institute, Preston.
12. William Stevenson, Glasgow and West of Scotland Agricultural College.
13. George Henry Garrad, South-Eastern Agricultural College, Wye.
14. Francis Alexander Thomson, Marischal College, Aberdeen.
15. Francis Strachan Marr, Aberdeen University.
16. { George Ramsey Bland, Harris Institute, Preston.
    { Tom Clark, Harper-Adams Agricultural College, Newport, Salop.
18. Joseph Stoker, Leeds University.
19. John Frederick Harrison, South-Eastern Agricultural College, Wye.
20. Robert Stanley Vinson, South-Eastern Agricultural College, Wye.
21. Frederick James Podmore, Harris Institute, Preston.
22. James Elgey, Leeds University.
23. Alfred Harold Heath, Harper-Adams Agricultural College.
24. Sydney Rothwell, South-Eastern Agricultural College, Wye, Kent.
25. William Sugden, Harris Institute, Preston.
26. John Wilson, Harris Institute, Preston.
27. Arthur Edward Bruce Fielding, Leeds University.
28. Annie Gladys Anyan, Harris Institute, Preston.

49. The Examinations for the National Diploma in Dairying were held this year for English students at the Midland Agricultural and Dairy College, Kingston, Derby, from September 24-28, and for Scottish students at the Dairy School for Scotland, Kilmarnock, from October 1-5. Thirty-two candidates were examined at Kingston, of whom 19 passed, and 20 candidates at Kilmarnock, of whom 14 passed. The following are the names of the successful candidates :—

Examination at Kingston.

WALTER BIFFEN, Midland Agricultural and Dairy College, Kingston.
GEORGE RAMSEY BLAND, Lancs. C.C. Farm, Hutton.
MRS. ANNA M. E. BOWMER, Midland Agricultural and Dairy College.
CHARLES ROBERT DEWEY, Midland Agricultural and Dairy College.
MISS MAUDE ELIZABETH DOBSON, Midland Agricultural and Dairy College.
ROBERT FENTON, University College and British Dairy Institute, Reading.
GEORGE E. H. FERRY, University College and British Dairy Institute.
MISS GERTRUDE MARION FREEMAN, Midland Agricultural and Dairy College, Kingston.
HAROLD GATHORNE, Midland Agricultural and Dairy College, Kingston.
JOHN MILLER LONSDALE, Lancs. C.C. Farm, Hutton.
MISS HILDA FRANCE NEWBIGIN, Midland Agricultural and Dairy College.
MISS EDITH NOBLE, Midland Agricultural and Dairy College, Kingston.
MISS ALICE HANNAH PIMLOTT, Midland Agricultural and Dairy College.
WILFRID SADLER, University College and British Dairy Institute, Reading.
ROBERT WILLIAM STANIFORTH, Lancs. C.C. Farm, Hutton.
WILLIAM SUGDEN, Lancs. C.C. Farm, Hutton.
MISS FRANCES MARY TAYLOR, Midland Agricultural and Dairy College.
MISS TANNIE WOOD, Midland Agricultural and Dairy College, Kingston.
VICTOR LIONEL YATES, University College and British Dairy Institute.

Examination at Kilmarnock.

MISS EDITH ANDERSON, Berryhill, Fowlis Easter, Dundee.
JOHN ANDERSON, Spango, Sanquhar.
JOHN COCHRANE, Byreholm, Penpont, Dumfries.
MISS CATHERINE M. DALLAS, 117 Warrender Park Road, Edinburgh.
MISS MARGARET TURNBULL DOUGALL, Bonybridge, Stirlingshire.
JOHN DUNLOP, Nether Balgillo, Tannadice, Forfar.
MISS MARY FINLAYSON, Ardjacie Farm, Tain.
MISS LILIAS LEES, Lagg Farm, Ayr.
THOMAS LIMOND, Whitehill, Trabboch, Ayr.
JAMES MACKINTOSH, Lilybank, Blairgowrie.
MISS GRACE ROBERTSON, The Dog Leap, Limavady, Co. Derry.
WILFRED GEORGE SANDEMAN, Ferndean, Lenzie, Glasgow.
JOHN HUNTER SMITH, Grange, Kilmarnock.
MISS LILY STRANG, Strathmuir, Allanshaw Road, Hamilton.

By Order of the Council :

THOMAS McROW,
Secretary.

16 BEDFORD SQUARE,
LONDON, W.C.
November 7, 1906.

ANNUAL REPORT FOR 1906 OF THE PRINCIPAL OF THE ROYAL VETERINARY COLLEGE.

Research Laboratory.

During the year 1906, 855 morbid specimens were forwarded for examination to the Laboratory at the Royal Veterinary College for Research in Comparative Pathology and Bacteriology. This represents a considerable increase over the number in the two previous years, viz., 692 in 1905, and 654 in 1904.

Anthrax.

The following Table shows the number of outbreaks of this disease, and the total number of animals attacked in each of the last six years :—

Year		Outbreaks		Animals attacked
1901	...	651	...	971
1902	...	678	...	1,032
1903	...	767	...	1,143
1904	...	1,049	...	1,589
1905	...	970	...	1,317
1906	...	940	...	1,326

As will be seen from these figures, there has been little variation in the prevalence of anthrax during recent years, and, for reasons which have been fully discussed in previous Annual Reports, there is not likely to be any notable decline in the number of outbreaks in the future. The proper burial or destruction of anthrax carcasses appears to be generally quite adequate so far as prevention of recurrent outbreaks on the same farm is concerned, but every year the disease makes its appearance on other farms on which there is no history of its previous occurrence. It is probable that in many of these cases the disease is introduced by feeding-stuffs or other materials imported from foreign countries in which anthrax is very common, and it appears at present to be impossible to devise any practicable measures to guard against this risk.

Cases which have come under observation during the past year give fresh emphasis to the importance of suspecting anthrax whenever a farm animal dies suddenly and unexpectedly, and to the danger of using the carcasses of such animals for the feeding of pigs.

Glanders.

The following Table shows the number of cases of this disease for each of the past six years :—

Year	No. of cases	Year	No. of cases
1901	2,370	1904	2,628
1902	2,040	1905	2,068
1903	2,499	1906	2,012

It will be seen from the above figures that during the past year no sensible progress has been made towards the extermination of the disease. As in all previous years, the great bulk of the cases of glanders reported have occurred in London and the Home Counties.

Throughout the rest of the country, if one excepts Birmingham, Manchester, and a few of the other large towns, glanders is rarely met with, and then practically always as a result of the introduction into the locality of a horse from London or one of the other large centres of permanent infection. The local outbreaks in country districts are always easily dealt with, as, when the disease has been diagnosed, there is usually little or no difficulty in determining what horses have been exposed to infection. By the use of mallein on the suspected animals it can then be ascertained which of them are actually infected. The number of these is usually not large, and by promptly slaughtering them the outbreak can be cut short without great expense to the local authority.

In London the circumstances are quite different. There, almost the whole of the large studs have long been more or less infected, and when a clinical case of the disease is detected it is often very difficult to ascertain precisely how many other horses ought to be considered as suspected. To eradicate glanders from the large London studs would require the systematic use of mallein on all the animals known to have been in the same stable with any horse found to be glandered, and in many instances the occurrence of a single case of clinical glanders would necessitate the application of the mallein test to some hundreds of horses. Experience already gained shows that a very considerable proportion, varying from 10 to 80 per cent. of the apparently healthy horses in infected stables will react when tested with mallein, and must therefore be regarded as actually glandered and capable of spreading the infection. No outbreak can be satisfactorily dealt with unless these apparently healthy, but in reality diseased, horses are either separated and permanently isolated or immediately destroyed. When the proportion of reacting animals in a large stud is a high

one, permanent isolation becomes practically impossible, and unfortunately the alternative procedure necessary to stamp out the disease is also impossible, in view of the very large sum of money that would have to be found to compensate adequately the owners of the slaughtered animals.

These facts have for some years been quite clear to all those who have specially studied the subject. It is recognised that the methods by which glanders is being dealt with in London at the present time are only of a temporising character, and that there is not the least prospect that there will be any material reduction in the prevalence of the disease unless more drastic measures are employed. It is understood that the Treasury has hitherto refused to make any grant from Imperial funds to enable the London County Council to provide the compensation that would have to be given to the owners of healthy horses compulsorily slaughtered.

Even from a purely agricultural view this is regrettable, for although the losses which glanders entails fall principally on the owners of large city studs, the disease is every now and again imported into country districts. An additional motive for endeavouring not merely to keep the disease in check, but actually to exterminate it, is provided by the fact that every year glanders claims a number of human victims from among those who have been attending glandered horses.

Swine Fever.

The following Table shows the number of outbreaks of this disease for the past eight years :—

Year	Outbreaks	Year	Outbreaks
1899	2,322	1903	1,478
1900	1,940	1904	1,196
1901	3,140	1905	817
1902	1,688	1906	1,280

The experience of the past year in connection with this disease is calculated to create a feeling of marked disappointment. The reduction in the number of outbreaks which occurred in 1904 and 1905, and especially towards the end of last year, appeared to justify a lively hope that the Board of Agriculture would soon succeed in actually stamping out the disease. Apparently, any such hope must in the meantime be abandoned, since swine fever is now actually more prevalent than it was two years ago. It is impossible to say confidently what has been the cause of the serious recrudescence which has been going on since the latter part of 1905.

The very fact that after so many years of effort the Board of Agriculture has failed to stamp out swine fever is quite likely to be used as an argument in support of the opinion that the disease is ineradicable. There is, however, no sufficient reason for taking such a despondent view. Although the contrary has sometimes been suggested, it may be regarded as certain that swine fever is a purely contagious disease, no pig ever becoming the subject of it except through direct or indirect connection with an antecedent case of the disease. It therefore follows that if it were possible to ascertain all the places at which the disease now exists and then to slaughter all the diseased and "in-contact" animals, and to carry out efficient disinfection of contaminated premises, the disease would thereby be finally brought to an end. The fact that the disease has not been exterminated and is actually now increasing proves that these conditions are not being fulfilled.

In particular, it must be inferred that the Board of Agriculture is not obtaining prompt information with regard to outbreaks, and as long as that is the case no progress in stamping out the disease can be expected. For some time past the Board of Agriculture has not dealt with every outbreak by those cattle plague measures which the late Sir George Brown long ago declared to be necessary for the eradication of swine fever. When the disease is diagnosed it is not the invariable practice of the Board to slaughter the whole of the pigs on the premises, but the owner is placed under serious restrictions with regard to the movement or sale of his animals, and often experiences considerable loss both on that account and through continued deaths from the disease long after the first case was detected. An owner so treated naturally feels that he has a serious grievance, and it is scarcely open to doubt that a knowledge of the fact, that in dealing with outbreaks where large numbers of pigs are concerned the Board of Agriculture does not always slaughter out and compensate, is calculated to lead to concealment of the disease. Needless to say if such concealment is practised in any considerable proportion of outbreaks, the disease will inevitably spread.

Fowl Cholera.

The disease termed fowl cholera is a very common one in most European countries, but the only available statistics with regard to it come from Germany, in which in one year as many as from seventy to eighty thousand cases of the disease are notified. The disease has so seldom been diagnosed in Great Britain that its occurrence in this country has actually been denied. In reality the disease appears to be not very common among British poultry, but from time to time cases

are diagnosed in the Research Laboratory at the Royal Veterinary College, and it is quite possible that many outbreaks are overlooked. During the year 1905 three outbreaks came under observation, and that is the largest number that has ever been met with in one year.

All the common breeds of domestic poultry are susceptible to fowl cholera, and in all of them the disease is of a deadly character. When once the disease breaks out it generally claims a number of victims every day ; and in a very short time, if no precautions be taken, scarcely a fowl may be left surviving. The duration of the illness is usually a day or two, during which the fowls have the plumage ruffled, show a bluish or livid discoloration of the comb, and suffer from diarrhœa. Sometimes the course of the disease is so acute that fowls perfectly well in the evening are found dead next morning.

Experience shows that in outbreaks of fowl cholera, the owners very frequently suspect that the poultry have been poisoned.

To a non-professional eye the internal organs of a fowl dead from this disease generally appear normal, but when the intestine is laid open there is nearly always more or less marked evidence of acute inflammation. The microscopic appearance of the blood, however, is of far more value for diagnosis than the appearance of any of the internal organs. Indeed, there are few diseases that can be diagnosed so readily and certainly by microscopic examination as fowl cholera. The cause of the disease is a very minute bacterium, which, at the time of death, is always present in such great numbers in the blood that its presence there can scarcely be overlooked by a bacteriologist.

As the disease is highly contagious, being spread by the fæces of affected birds, and the course of the disease is rapid, it is of the utmost importance to make an early diagnosis. When the existence of the disease has been established, all the fowls showing any symptoms of infection ought to be destroyed or isolated, and the remainder should be moved to fresh premises, or, if the season of the year permits, penned on fresh ground, which ought to be changed from day to day until at least a week has elapsed without a fresh case.

Where a complete history is obtainable, it is generally possible to trace outbreaks of fowl cholera to the recent purchase of an infected fowl, but sometimes the occurrence cannot be accounted for in this way, and it appears not impossible that the disease is occasionally sporadic.

Psorospermosis.

Psorospermosis and coccidiosis are the names applied to diseased conditions caused by certain microscopic animal

parasites. Cases of disease of this kind have been described as occurring in most of the common domesticated mammals, and occasionally in man himself, but by far the commonest subject of coccidiosis is the rabbit. In the rabbit the disease very frequently affects the liver, and there produces appearances that have often been mistaken for tuberculosis. It also affects the intestines of the rabbit, either alone, or in common with the liver. Coccidiosis is also a disease of the domesticated fowl, but during the last fifteen years only one outbreak of coccidiosis among fowls has been detected in the Research Laboratory at the College. On the other hand, every year in early summer numerous cases of coccidiosis among young pheasants come under observation; indeed, there can be no doubt that this is the great plague of young pheasants reared under artificial conditions. The deaths usually begin when the young birds are a few weeks old, and within a very short period the mortality may reach 50 to 80 per cent. of all the young birds on the ground.

The diagnosis after death, or even during life, by examination of the fæces is a very easy matter, as the intestines and fæces contain great numbers of the so-called coccidia. The excrement of these birds infects the ground on which they are kept, and it will be readily understood how, in favourable circumstances, the disease spreads with alarming rapidity.

It is, of course, a very well-known fact that it is extremely dangerous to use the same ground on two successive seasons for pheasant rearing; but, unfortunately, serious outbreaks of coccidiosis may occur among pheasants on fresh ground. Probably in these cases the disease is introduced by some of the hens used for hatching, for, judging from what is known with regard to the similar disease in rabbits, it is not unlikely that adult fowls are sometimes the subject of coccidiosis although their general health is not seriously affected.

Reference has been made to this subject here because it has more than once happened that when an owner who has sent dead pheasants for examination has been informed that the cause of death was psorospermosis, he has written, asking to be informed in plain English what was the name of the disease. Unfortunately, the answer to this has to be that there is no plain English or other common term for the disease in question.

A New Disease of Cattle (*Johne's Disease*).

Perhaps the most important fact to be recorded in this Report is that, during the past year, cases of a bovine disease hitherto not identified in this country have been met with. The only justification for calling the disease a new one is that

the first recorded case was described in Germany by Johne and Frothingham in 1895. For nearly ten years afterwards no other case of the disease appears to have been observed, or at least described; but during the last three years further cases have been described as occurring in Germany by Markus (1904), in Belgium by Lienaux and van den Eeckhaut (1905), in Switzerland by Borgeaud (1905), and in Denmark by Bang (1906). Although only a comparatively small number of cases have thus been recorded as yet, there is every reason to believe that the disease is not, in the proper sense of the word, a new one; on the contrary, it is quite possible that it may have existed as a disease of cattle from time immemorial, and have been overlooked through being confounded with other affections with somewhat similar symptoms.

The above-mentioned authors, Johne and Frothingham, to whom belongs the honour of having, so to speak, discovered the disease, regarded it as a form or variety of tuberculosis, and other authors have since applied the name pseudo-tuberculosis to it. As will presently be explained, the disease appears to be entirely distinct from tuberculosis, and it would therefore be very undesirable to apply to it any term likely to suggest a connection between the two diseases. The disease has also been termed chronic bovine enteritis, which designation is in agreement with the fact that the principal lesions are situated in the intestines, and take the form of a slowly developing or chronic inflammation. Nevertheless, this name is not free from objection, since cattle may be the subjects of different forms of chronic inflammation of the intestines. Hence, the writer of this Report ventures to suggest that the disease should in future be known as "Johne's Disease."

During the past year the disease was identified as occurring on six different farms in various parts of the country, and an opportunity was obtained to make a complete post-mortem examination of five animals killed at an advanced stage of illness. The following account of the symptoms, course of the disease, and post-mortem appearances, is based on the observations made in connection with these cases.

Symptoms and course of the disease.—In all the cases investigated there was a history of the occurrence of previous cases on the same farm, extending for several years back in some of them. The ages of the animals attacked varied from yearlings to adult or middle-aged cattle. In all cases the most striking symptom was more or less rapid loss of condition, the emaciation always becoming very pronounced when the course of the disease was not cut short by slaughter. In every case diarrhœa was also a prominent symptom throughout the greater part of the illness, but sometimes the owners were able to

diagnose the onset of the affection by a falling off in condition before the diarrhœa had set in. As a rule, when once the diarrhœa had begun, it persisted until the end, the rate of loss of condition being proportional to the profuseness of the diarrhœa. Beyond these two symptoms, emaciation and diarrhœa, there was never any marked disturbance of the normal functions until near the end, and the appetite was good throughout.

Lesions.—The disease is essentially one of the intestines, and indeed, the other organs of the body do not usually present any alteration apparent to the naked eye. Moreover, the alterations within the intestine are themselves not of a very conspicuous character, and it is quite certain that they might easily be overlooked. As a rule, both large and small intestines are involved in the disease, but there is some reason to think that the small intestine is primarily affected, and the alterations in it are usually most pronounced. As a rule a variable length of the small intestine next the stomach is unaffected. Even before the intestine is cut its walls give to the fingers an impression of abnormal thickness, and when an affected piece of bowel is slit open the mucous membrane which lines it is found to present an appearance which is most characteristic of the disease. The abnormality of this appearance lies in the fact that the surface of the membrane shows a coarse wrinkling or corrugation. When a cut is made across the bowel wall it becomes apparent that it is the internal coat or mucous membrane which is increased in thickness. This thickening of the mucous membrane is, in the case of the small intestine, as a rule, not associated with any very marked inflammatory congestion. In the large intestine the thickened and wrinkled mucous membrane usually shows more congestion, and not infrequently small hæmorrhages are present. An important point to be noticed is that in none of the cases examined was there any ulceration or formation of actual nodules such as may be found in genuine tuberculosis of the intestine.

The lymphatic glands of the intestine, and especially the mesenteric group, are perhaps a little larger than normal, but here, again, the abnormality is not at all pronounced. When the glands are incised their substance appears pale and watery, but beyond this the naked eye detects nothing unusual.

These intestinal and glandular alterations appear to constitute the whole of the alterations peculiar to the disease. In one of the animals examined post mortem a tuberculous lesion was found in one of the glands of the chest, but this observation does not point to any relationship between tuberculosis and the disease now under consideration. The animal simply happened to be the subject of both diseases.

In the other cases examined no trace of tuberculosis was found anywhere. In three of the cases examined the fourth or true digestive stomach appeared to be perfectly normal. In the fourth animal the mucous membrane of this stomach was in a markedly œdematous or dropsical condition, and there were numerous very shallow erosions on it.

Microscopic examination is necessary in order to ascertain what is the nature of the alteration which produces the thickening of the intestinal mucous membrane, and such examination at the same time reveals the cause of the disease. As Johne and Frothingham discovered, the diseased mucous membrane contains immense numbers of a small bacillus which is not unlike the bacillus of tuberculosis in shape and size, and which resembles that organism still more closely in what may be called staining reactions. The tubercle bacillus is the most important member of the group of what are called acid-fast bacteria, the distinguishing character of which is that when once they have been stained with any one of the dyes in common use in bacteriology they cannot readily be decolourised even by the use of strong acid solutions. The bacillus of Johne's Disease is one of these acid-fast organisms, and by taking advantage of this fact it is very easy to demonstrate the presence of the bacteria in sections or even in scrapings from the diseased mucous membrane. In most of the cases that have been examined the number of these bacteria present in the thickened mucous membrane was colossal, and a marked feature of them is their tendency to be aggregated into comparatively large groups. As previously stated, the bacteria in question are not unlike tubercle bacilli in shape and size, but on an average they appear to be somewhat smaller.

The microscopic alterations in the diseased mucous membrane comprise a partial destruction of its surface epithelium, and of the epithelium of the villi in the case of the small bowel, and also an addition of a certain amount of new cellular tissue between the tubular glands and in the substance of the villi. This cellular infiltration frequently extends to the sub-mucous coat, immediately under the deep ends of the tubular glands. It is in this new cellular material that the bacilli are found imbedded. Contrary to what is the case in tuberculous lesions, the cellular infiltration or multiplication is quite diffuse, and not in the form of nodules or tubercles. A further distinction between the two processes is that in Johne's Disease there appears to be no tendency to the peculiar tissue degeneration called caseation, or to calcification. On the other hand, the two processes resemble each other in that giant cells are often present in their respective lesions.

The same acid-fast bacteria are also present in the mesenteric glands in Johne's Disease, but usually in smaller numbers than in the diseased intestinal mucous membrane.

The facts already mentioned indicate that the bacillus of Johne's Disease is an organism distinct from the bacillus which is the cause of tuberculosis in cattle, and the difference between them is further brought out when they are used to inoculate guinea-pigs. These animals invariably contract a fatal disease when they are inoculated with even minute numbers of bovine tubercle bacilli, but experiments which have been made in connection with the cases of Johne's Disease observed in this country corroborate the observations previously made on the Continent, and prove that the disease is not transmissible by inoculation to the guinea-pig.

Attempts were made to cultivate the bacilli from these cases of Johne's Disease on artificial media, but hitherto without success. This negative result is in agreement with the experience of those who have experimented in the same direction on the Continent.

Probable habit of the bacillus of Johne's Disease.—A point of great practical importance in connection with every bacterial disease is to know whether it is a purely contagious one or whether it is sometimes or always sporadic. Whether a disease belongs to the first or the second of these categories depends entirely upon whether the bacteria are incapable of multiplying except in the bodies of infected animals or are able to maintain their existence by multiplying in the outer world. In the latter case, the disease may obviously arise independently of contagion or infection, and it is equally obvious that in the former case no animal can ever, in natural circumstances, become infected except through the agency of bacteria which have come from a previously diseased animal. Applying these considerations to Johne's Disease, one may ask whether the bacilli which are the cause of it are capable of multiplying outside the bodies of diseased animals—in the soil, in animal excrement, in water, on forage plants, or in decaying vegetable matter, for example. In view of the difficulty, amounting hitherto to an impossibility, of cultivating the bacillus artificially, even under the most favourable conditions, this question must in all probability receive a negative answer. In other words, Johne's Disease must be regarded as a purely contagious one, the vehicle of infection being the excrement of affected animals. As previously stated, in advanced cases of the disease the bacilli are present in enormous numbers in the lining membrane of the intestine, and some of them are constantly escaping into the bowel, to be passed outwards with the fæces. There is consequently no difficulty in understanding how the

disease spreads ; indeed, it is obvious that, given a single case of the disease, an actual outbreak, comprising numerous simultaneous or successive cases, is likely to be the result unless special precautions are taken to isolate the affected animal and destroy its excrement. A point upon which we at present possess no information is the capacity of the bacteria for retaining their vitality in the outer world when they have been voided from the bowel. Upon this will depend the difficulty of disinfection and the length of time for which infected premises or pastures will remain dangerous.

Diagnosis.—In a previous Annual Report reference was made to cases of diarrhœa and wasting in cattle caused by the presence of minute worms in the fourth or true digestive stomach,[1] and the account of the symptoms of this parasitic gastritis there given would with little or no alteration apply to the present disease. That there occurs in cattle as well as in sheep a genuine parasitic gastritis caused by worms there can be no doubt, but it is quite possible that hitherto many cases of Johne's Disease have been confounded with parasitic gastritis, the latter disease being diagnosed simply from the diarrhœa and emaciation. It is well known that small numbers of various round worms may be found in the true stomach in apparently healthy cattle, and it would be a mistake to attach any pathogenic importance to worms in that position unless they are present in large numbers. In future there will be no difficulty in distinguishing between parasitic gastritis and Johne's Disease when an opportunity is afforded to make a post-mortem examination. The peculiar thickened and wrinkled condition of the mucous membrane in the latter disease is by itself a fairly reliable guide to diagnosis, and when any doubt remains, that can readily be resolved by searching the scrapings from the mucous membrane for the characteristic acid-fast bacilli.

While the animal is still alive diagnosis is not so easy. Naturally it would occur to one to search the fæces for acid-fast bacteria in any suspected case, but a difficulty here arises from the fact that other species of acid-fast bacteria which grow on some of the grasses may be found in the excrement of perfectly healthy animals. Such acid-fast "grass bacilli," however, are seldom to be found in any considerable number in the fæces, and therefore when large numbers of acid-fast organisms, many of them collected together in groups, are found in the fæces of an animal suffering from diarrhœa and wasting, there would probably be little risk of error in diagnosing the case as one of Johne's Disease.

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[1] Journal R.A.S.E., Vol. 64, 1903, pp. 280-282.

Treatment and prevention.—According to all the experience hitherto gained, Johne's Disease is invariably fatal. The diarrhœa may be temporarily checked, but the loss of condition continues, and in the end the animal becomes so weak that it is unable to rise. The duration of the illness is variable. In one of the cases examined post mortem during the past year, the animal had survived for nearly a year after the onset of distinct symptoms, but sometimes the loss of condition is much more rapid, and death may occur in two or three months.

At the present moment it is impossible to say what period usually elapses between time of infection and the onset of distinct symptoms, but in all probability the period of incubation is often a long one, extending possibly to many months. Some precise information with regard to this point will probably be gained in the future by experiment. Unfortunately, there is reason to fear that animals may be capable of spreading the infection some considerable time before they themselves show any decided symptoms.

The disease being in the present state of our knowledge incurable, and affected animals being a source of danger to others kept in the same premises or pasture, it follows that the best course to adopt when the disease has been certainly diagnosed is to have the animal or animals promptly slaughtered. The manure of such animals ought either to be destroyed or spread on land that is going to be ploughed down. Unfortunately, on some farms the disease appears to have established a firm footing, owing to the fact that cases have occurred for years past, and that no measures have been taken to prevent the spread of the disease or the infection of the pastures. Any field that is specially infected might be used exclusively for grazing sheep or horses, as there is reason to believe that animals of these two species are not susceptible to the disease. Probably little or no benefit is to be expected from the application of lime or any other dressing to the pasture.

J. McFadyean.

Royal Veterinary College, London, N.W.

ANNUAL REPORT FOR 1906 OF THE CONSULTING CHEMIST.

THE number of samples analysed in the Society's laboratory during the twelve months, December 1, 1905, to November 30, 1906, approached very closely to that of the previous year, being 559 as against 571. The complete list is given at the close of this Report, and does not show any marked difference from the lists of former years.

The most important feature, so far as the analytical work on behalf of members of the Society is concerned, has been the introduction and passing into law of a new Fertilisers and Feeding Stuffs Act, superseding the former Act of 1893. It had come to be recognised that the old Act, however good in its intentions, had practically failed to fulfil the hopes that had been expressed concerning it, and, though useful in its provisions when energetically prosecuted, had in many parts of the country become almost a "dead letter." Hence the necessity, recognised on all hands, of introducing further legislation. It was found best to do this by means of a new Act rather than by an amendment of the existing one. Previous to this being brought in, the suggestions of the Royal Agricultural Society of England and other bodies were sought by the Board of Agriculture, and it can be recorded with satisfaction that effect has been given in great measure to the Society's representations. The main difficulties in connection with the working of the old Act were threefold : (1) the reluctance of the farmer to take up the position of prosecutor ; (2) the complicated procedure as regards sampling ; (3) the evasion of the Act by the giving of worthless guarantees. These difficulties it has now been sought to remedy (1) by the appointment of official samplers to act under County Councils and Boroughs ; (2) by simplification of procedure in sampling ; (3) by compelling the giving of a guarantee of, within reasonable limits, the actual contents. Further, a guarantee is now required in the case of prepared feeding stuffs as well as of fertilisers.

It may at once be said that these changes have produced a much improved Measure, and, with the issue of the Regulations that accompany it, bid fair to make the Fertilisers and Feeding Stuffs Act a much more useful one. The purchaser will largely be relieved from the odium attached to throwing doubt upon the *bonâ fides* of the vendor, and from the formalities associated with taking samples and forwarding them for analysis. He will also have the satisfaction of knowing that, in future, if he has had sold to him superphosphate of, say, 26 per cent. "soluble phosphate," or linseed cake with 10 per

cent. of oil, he is fairly secured to getting within 1 per cent. or so of these quantities, or, failing it, will be able to demand compensation.

On the other hand, the Act still presents deficiencies, possibly unavoidable. The power which County Councils formerly possessed, of instituting action on their own account, is now taken away, and this may lead, not improbably, to a decrease of local interest and energy. Further, the Act, though it will put an end to the giving of bogus guarantees that comply with the letter rather than the spirit of the law, fails (as probably all Acts must fail) in securing to the purchaser that the price he has to pay for an article has any necessary relation to its intrinsic value. A vendor can still, though guaranteeing the actual contents, charge whatever price he likes.

Accordingly, I anticipate that, though the new Act may cause a considerable increase of activity in having analyses made under County Council and Borough auspices, there will yet be ample scope for the carrying on of the beneficial work which the Royal Agricultural Society of England has now for so long a period conducted on behalf of its members. Lastly, it may be pointed out that the new Act will concern itself mainly, or almost entirely, with the civil relations between vendor and purchaser, and that the criminal sections of the Act will only rarely, and in extreme cases, be taken up.

Coming to the main features presented in the following Report, it may be said that throughout the year the examination of fertilisers generally has shown an exceedingly satisfactory condition of things. Of feeding stuffs, however, the same can hardly be said. Foreign-made linseed cakes have, in several instances, been found to be unsatisfactory, whilst Bombay cotton-cake has, as a class, distinctly deteriorated, this deterioration being specially marked in an increase in the sand and dirt attaching to the woolly fibre of the seed. Instances are given of this exceeding 1 per cent. and sometimes going up to 5 per cent. In compound feeding cakes and meals harmful ingredients, such as castor-bean husk, have been not infrequently found, and a new danger has been introduced by the discovery that certain foreign beans, known variously as "Java beans" or "red Rangoon beans," become poisonous through the development in them of hydrocyanic (prussic) acid. Numerous materials in which beet-sugar molasses form a considerable item continue to be largely offered, and, generally speaking, at prices much beyond their value. They obtain, however, a ready sale mainly because, their sweetness inducing animals to take them greedily, purchasers think they must be excellent foods.

A. Feeding Stuffs.

1. *Linseed Cake.*

It has been mentioned that one change effected by the new Fertilisers and Feeding Stuffs Act is that, in future, a guarantee of composition will have to be given with respect to all prepared feeding stuffs—linseed, cotton, and all compound cakes and meals, for example. This guarantee is to be confined to a statement of the percentages of oil and albuminoids. That something of this kind will work advantageously to the purchaser is shown by the setting out of the following analyses of four samples of linseed cake which had been offered to a member at prices differing but little from one another, though the analyses show that the cakes were very different in quality :—

	A	B	C	D
Moisture	12·81	13·25	11·83	9·96
Oil	9·46	9·08	9·09	11·31
[1]Albuminous Compounds (flesh-forming matters) .	25·44	23·50	28·38	37·44
Mucilage, sugar, and digestible fibre . . .	36·81	42·75	36·52	29·63
Woody fibre (cellulose) .	7·36	6·39	7·79	5·69
[2]Mineral matter (ash) . .	8·12	5·03	6·39	5·97
	100·00	100·00	100·00	100·00
[1]Containing nitrogen . .	4·07	3·78	4·54	5·99
[2]Including sand . . .	1·99	0·40	0·65	0·94

A cost 8*l.* 6*s.* 8*d.* per ton, delivered.
B „ 8*l.* 15*s.* 0*d.* „ „
C „ 8*l.* 5*s.* 0*d.* „ „
D „ 8*l.* 5*s.* 0*d.* „ „

Of the four cakes, "A" was a very impure one, containing, as it did, mustard seed, cockle seed, and niger seed, with 2 per cent. of sand ; "B" was of fair purity ; "C" hardly as good ; while "D," though the lowest-priced cake, was quite pure and of much the highest quality.

A similar difference of quality, though prices were much alike, was found in the case of a member who sent two linseed cakes for oil determination, the results being :—

	A	B
Percentage of oil . .	11·43	6·60
Price per ton . . .	8*l.* 10*s.*	8*l.* 5*s.*

Moreover, while "A" was quite pure, "B" was far from being so.

As previously indicated, the new Act should do much to remedy these anomalies.

Considerable difficulty is often found in obtaining any satisfactory guarantee as to either the purity or the quality of linseed cakes of foreign manufacture, the vendors stating that they have no control over these matters and must just sell the cakes as they are represented to them. A common form of guarantee, which, however, can hardly be called a "guarantee" at all, is the following :—

> "Foreign Cakes.—American, Russian, and all imported Cakes and Feeding Stuffs are guaranteed of the usual good and merchantable quality of the brand or description stated, but exact composition unknown."

The following are analyses of some of these "foreign-made linseed cakes" which have been submitted to me during the year :—

	Russian make		Polish make
	A	B	C
Moisture	10·65	13·11	11·50
Oil	6·95	6·59	18·01
[1]Albuminous compounds (flesh-forming matters)	25·81	27·06	28·13
Mucilage, sugar, and digestible fibre.	41·61	40·17	30·27
Woody fibre (cellulose)	8·31	7·59	6·76
[2]Mineral matter (ash) . . .	6·67	5·48	5·33
	100·00	100·00	100·00
[1]Containing nitrogen . . .	4·13	4·33	4·50
[2]Including sand	1·49	0·55	0·45

"A" cost 8*l.* per ton, delivered ; it was not pure, but contained a quantity of starchy impurities and weed seeds, though invoiced as "Linseed Cake." Its lowness in oil and albuminoids is noticeable. "B" cost 8*l.* 3*s.* per ton and was of similar low quality. It was likewise impure, spurry and other weed seeds being present in quantity. While giving this general warning as regards "foreign-made" cakes, it is only right to add that these are not by any means always to be avoided. This is instanced by the analysis "C," the cake being one of Polish manufacture, and said to be hand-pressed by the peasants. It was practically a pure cake, and contained upwards of 18 per cent. of oil, the cost being 8*l.* 2*s.* 6*d.* per ton, delivered.

2. *Decorticated Cotton Cake.*

Decorticated cotton cake has unfortunately, as usual, been very hard to get of good quality, and, though only occasionally found to be adulterated, the uncertainty attaching to getting a good cake has made purchasers shy of using this relatively most economical feeding material. The following is an analysis

of a cake submitted to me, which was both inferior in quality and excessively dear, the price being 8*l.* 13*s.* per ton delivered:—

Moisture	9·88
Oil	6·90
[1] Albuminous compounds (flesh-forming matters)	42·62
Mucilage, sugar, and digestible fibre	27·29
Woody fibre (cellulose)	7·13
[2] Mineral matter (ash)	6·18
	100·00
[1] Containing nitrogen	6·82
[2] Including sand	0·35

3. *Undecorticated Cotton Cakes.*

While ordinary home-made cotton cake has been, generally speaking, of good quality and in good condition, this is far from being the case with the class of cake known as "Bombay cotton cake." I confess that I have never been favourably disposed towards this kind of cake, as I cannot bring myself to think that it can be used for stock without running risk on account of the woolly fibre attaching to the seed. But the experience of the past year has led me to regard it even less favourably, for I have noticed a steady rise in the percentage of sand and dirt which occur in these cakes and which result from less care being taken in cleaning the seed. At first, ·50 per cent. of sand was about the amount usually found, as against a maximum of ·25 per cent. in cakes made from Egyptian seed; but, as the following analyses show, the percentage is now considerably increased, and it is exceptional, according to my experience, to find a Bombay cotton cake with less than 1 per cent. of sand.

	A	B	C	D	E	F
Percentage of ash	5·52	5·54	5·87	6·00	5·93	5·73
,, ,, sand	1·04	0·94	1·19	1·25	1·12	1·25

Still higher and exceptional figures are found in the following:—

	A	B
Moisture	10·47	11·36
Oil	4·69	4·36
[1] Albuminous compounds (flesh-forming matters)	20·56	18·88
Mucilage, sugar, and digestible fibre	36·46	34·60
Woody fibre (cellulose)	20·39	18·97
[2] Mineral matter (ash)	7·43	11·83
	100·00	100·00
[1] Containing nitrogen	3·29	3·02
[2] Including sand	2·09	5·23

In only one of the foregoing cases was borax found to be absent.

4. *Compound Feeding Cakes and Meals.*

The samples sent have been of the usual variable quality, some being quite good and made from sound and suitable feeding materials, while others have been made the media for using up matter of, to say the least, "doubtful" nature. It not infrequently happens that, in the making up of a compound cake, oil-containing materials are imported from abroad of which little is known, and as they come over with castor oil beans, or are shipped at ports whence castor bean is exported, a source of danger thereby attaches to their use. I have had before me several instances of the use of such materials in which castor bean, to more or less extent, often occurs, and their use in compound cakes subsequently has led to cases of injury and death to stock.

5. *Java Beans.*

A further source of danger to stock has been observed from the use of beans imported from abroad under the names "Java beans" or "red Rangoon beans," and their composition and nature have been made the object of study by several investigators. It has now been ascertained that they contain an ingredient capable of developing hydrocyanic (prussic) acid, and so poisoning stock. In Scotland, especially, there have been several instances of serious losses from the use of these beans, and it behoves stock owners to be on their guard respecting the use of bean meal which may possibly contain these foreign beans. For my own part I hold that it is unwise to purchase, in the form of meal, beans, maize, and other foods which are readily obtainable whole; much the best plan is to purchase these in the whole state, when impurities can be readily detected, and to grind them into meal on the farm.

6. "*Sharps*" *adulterated with Coffee-bean Husk.*

Attention has been drawn in previous Reports to the use of the husk or "parchment" skin of the coffee bean as an adulterant of bran, "sharps," and other milling products. The exposure of this practice in the publications of the Society has, no doubt, been responsible, in great measure, for the general cessation of the practice, but now and again instances come up of its recurrence. One such case was before me recently, and in this the coffee-bean husk was so finely ground up as to make its detection, except by the microscope, impossible.

7. *Miscellaneous Feeding Materials.*

Two analyses are appended—the first of maize germ cake, and the second of oat siftings from the manufacture of a

special kind of oatmeal. The former cost 6*l.* 5*s.* per ton, and was free from impurity. It had, however, a somewhat insipid taste, and, considering the analysis, it is questionable whether it is any improvement on maize itself, at the respective prices. The "oat siftings" at 3*l.* 15*s.* per ton must be considered excessively dear, and the material, indeed, is of very questionable feeding value.

	Maize germ cake	Oat siftings
Moisture	9·32	8·63
Oil	6·71	3·09
[1] Albuminous compounds (flesh-forming matters)	14·19	7·37
Mucilage, sugar, and digestible fibre .	61·17	49·84
Woody fibre (cellulose) . . .	3·92	25·71
[2] Mineral matter (ash)	4·69	5·36
	100·00	100·00
[1] Containing nitrogen	2·27	1·18
[2] Including sand and silica . . .	0·05	3·72

B. Fertilisers.

Of the ordinary fertilisers, such as mineral superphosphate, dissolved bones, basic slag, nitrate of soda, kainit, &c., it may be said generally that the trade in them has been very satisfactory, leaving the farmer very little to complain of. Mineral superphosphate of as high a grade as 35 per cent. "soluble phosphate" has come largely into use, through the employment of raw phosphate of high grade and capable of easy working; and, though the quality has increased, the price is relatively lower to the purchaser than it used to be. Basic slag has, with few exceptions, been found to come up to the requirements of the guarantees given. No instances have been met with of adulteration of nitrate of soda, sulphate of ammonia, or kainit. Altogether, as regards the supply to the farmer of the ordinary staple manures of the farm, it may be said, in fairness to the trade, that there is but little cause for the intervention of a new Fertilisers and Feeding Stuffs Act.

It will, therefore, be only necessary for me to note briefly any special cases that have occurred, and to mention any new materials that have come forward.

1. *Peruvian Guano (Phosphatic).*

An excellent sample of the more phosphatic kind of Peruvian guano, such as is suitable for root-growing or in hop and fruit gardens, was the following :—

Moisture	12·37
[1] Organic matter	13·67
Phosphate of lime	39·62
[2] Alkalies, &c.	17·73
Insoluble siliceous matter	16·61
	100·00
[1] Containing nitrogen	2·65
Equal to ammonia	3·22
[2] Containing phosphoric acid	6·89
Equal to phosphate of lime	15·03
Potash	3·16
Equal to sulphate of potash	5·85
Total phosphate of lime	54·65

The price of this was only 4*l.* 18*s.* 9*d.* per ton, and must be considered very low.

2. *Refuse Manures.*

As usual, it is in the class of materials that may be put under the above name that the greatest uncertainty prevails. These are generally sold for what they will fetch, and though they may be offered with a guarantee of quality, there is, even under the provisions of the new Act, no means of knowing—short of analysis—whether they are at all worth the price or not. Instances are the following :—

	A
Moisture	20·04
[1] Organic matter and water of combination	41·05
Monobasic phosphate of lime	2·44
Equal to tribasic phosphate of lime (bone phosphate) rendered soluble by acid	(3·82)
Insoluble phosphates	1·25
Sulphate of lime, alkaline salts, &c.	14·13
Insoluble siliceous matter	21·09
	100·00
[1] Containing nitrogen	3·06
Equal to ammonia	3·71
	B
Moisture	2·14
[1] Carbon and loss on heating	42·53
Phosphoric acid	0·16
Lime	3·74
Oxide of iron	23·50
Insoluble siliceous matter	27·93
	100·00
[1] Containing nitrogen	0·35
Equal to ammonia	0·59

"A" was described as a "new kind of manure," costing 3*l.* 5*s.* per ton, delivered, and sold as a "potato manure."

Shoddy and coal ashes figured among its ingredients, but it was, to my mind, very far from being what a "potato manure" should be, and the price was just about 1*l.* per ton above the real value. It may be but a coincidence, but my experience tells me that whenever a refuse manure is sold at a price of 3*l.* or from that to 3*l.* 10*s.* a ton, I must be suspicious of it. "3*l.* 10*s.* per ton, delivered," seems a favourite quotation for these nondescript articles.

"B" was sold at the seemingly low price of 7*s.* per ton, being produced at Wolverhampton; the analysis, however, shows it to be practically worthless as a manure.

3. *Chicken Manure.*

The analysis is given of a sample of manure produced in the fattening of chickens on a large scale. The trouble with such materials is, as a rule, the wet and lumpy condition in which they are, and the difficulty of applying them to the land. The following was, however, considering its nature, in very fair condition, and, at the price—1*l.* per ton, delivered—at which it was offered, cannot be called too dear :—

Moisture	47·25
[1]Organic matter	26·97
[2]Phosphoric acid	1·22
Lime	4·89
Alkalies, &c.	7·05
Sand	12·62
	100·00
[1]Containing nitrogen	1·16
Equal to ammonia	1·14
[2]Equal to phosphate of lime	3·66

4. *Damaged Cotton Seed.*

This material has, in several instances, been brought to my notice. It is not the damaged cake, but the cotton seed itself which has become damaged or heated, and so is only useful as manure. The analyses of it, however, show that, as compared with rape cake or other refuse cakes used as manure, it is relatively dear.

	A	B	C
Moisture	17·01	46·40	14·26
[1]Organic matter	77·61	50·10	81·49
Alkalies, &c.	3·39	2·40	3·35
Sand	1·99	1·10	0·90
	100·00	100·00	100·00
[1]Containing nitrogen	1·28	0·79	1·31
Equal to ammonia	1·55	0·96	1·59

"A" and "B" both cost 12*s.* 6*d.* per ton. The former, if it could be got on the farm for the price, would be just about worth purchasing, but "B" was much wetter and consequently poorer in quality. "C" cost 30*s.* per ton, and was clearly much too dear.

5. *Soot.*

The variable quality of soot and the need of ascertaining its quality before using it, have frequently been commented on by me. The following is the analysis of a sample submitted to me under the name "Soot":—

Moisture	2·84
[1] Organic matter and salts of ammonia	14·82
Oxide of iron, alkalies, &c.	18·47
Sand	63·87
	100·00
[1] Containing nitrogen	0·46
Equal to ammonia	0·56

This, though guaranteed as "pure soot," was an almost worthless article, containing about 64 per cent. of siliceous matters, and not more nitrogen than is possessed by a fairly fertile pasture soil.

6. *Raw Phosphate.*

Occasionally the farmer has offered to him raw material of phosphatic nature, such as ground phosphate, Belgian phosphate, &c., which, however useful it may be to the manufacturer of artificial manures, has, owing to its slow availability, but little use to the farmer. Of such was the following, offered at 2*l.* 12*s.* per ton, it being really Belgian phosphate, and containing, as that material does, a considerable amount of carbonate of lime:—

Moisture and organic matter	4·13
Phosphate of lime	50·23
Carbonate of lime, &c.	45·19
Sand	0·45
	100·00

7. *Ground Lime.*

I cannot say that my experience of ground lime during the past twelve months has been any more favourable than I previously reported it to be; and, though good samples can be met with, they have to be looked for, and considerable care must be exercised in the purchase. The following are cases in point:—

	A	B		C
Oxide of iron and alumina . .	2·98	1·49	Oxide of iron and alumina .	7·93
Lime . . .	77·14	86·54	Lime	43·37
Magnesia, carbonic acid, &c. . .	6·86	7·58	Carbonic acid, &c. . .	29·59
Insoluble siliceous matter . .	13·02	4·39	Insoluble siliceous matter .	19·11
	100·00	100·00		100·00

"A" was inferior in quality and decidedly lumpy, not being at all what "ground" lime should be. "B," though better in quality, was still distinctly coarse as regards grinding. Both samples came from the York district.

"C" was a sample of "lime ashes," obtained in Hampshire, and, though costing only 3*s.* 8*d.* per ton, could not be worth carting any distance, seeing the large amount of extraneous matter it contained.

8. *Flue Dust.*

A sample of this, taken from the flues of boilers at a colliery, was sent me and analysed as follows :—

Loss on heating	4·34
Oxide of iron and alumina. . . .	41·16
Lime.	13·54
Siliceous matter	35·21
Carbonic acid, alkalies, &c. . . .	5·75
	100·00
Nitrogen	none

This, it will be noticed, has a small quantity of lime in it, but any value it might have is discounted by the presence of a large amount of sulphur compounds injurious to vegetation.

9. *Lime Waste from Boiler Water.*

The precipitated mass formed in softening boiler water with lime has, as the chief objection to its employment in agriculture, the difficulty of getting it in dry and portable form. In one case referred to me, however, the lime waste had been subsequently pressed in hydraulic presses and so dried, being obtained in portable form, easy of application to the land. It gave the following analysis :—

Water of combination, &c. . . .	13·21
Carbonate of lime	74·50
Magnesia	8·61
Silica	3·68
	100·00

10. *Calcined Ironstone.*

A member of the Society, having at hand a quantity of this material, in the form of powder, thought that it might contain sufficient lime and phosphoric acid to make it worth while applying as a dressing to grass land. On analysis, however, it was found to contain only a trace of phosphoric acid, and :—

	Per cent.
Lime	2·37
Silica	36·44

it being, thus, practically worthless for manurial purposes.

C. Soils.

The examination of samples of soil has been instrumental in bringing out, in many cases, explanation of observed facts, and in pointing to manifest deficiencies in certain constituents of the soil. The following are analyses of two samples of soil from a field of low-lying land in North Wales. On the portion represented by "A" almost nothing would grow except a mass of sorrel, while on soil "B" quite a fair crop of roots was raised.

	A	B
Organic matter and loss on heating	45·40	59·95
Oxide of iron and alumina	6·53	6·81
Lime	0·22	0·99
Magnesia, alkalies, &c.	1·32	1·26
Insoluble silicates and sand	46·53	30·99
	100·00	100·00

A comparison of the two analyses will show how marked was the difference between the amounts of lime in the two soils, the presence of this to a greater extent in "B" having, doubtless, "sweetened" the land.

In another instance a member sent me a sample of soil from a field which he described as "in parts growing absolutely nothing." He mentioned that six years previously lime had been applied on one strip, and here barley grew quite fairly. Analysis of the soil brought out the fact of its great poverty in lime, while the result of applying lime supplied a useful confirmation of what has been so clearly demonstrated in the Woburn Field Experiments.

Organic matter and loss on heating	3·56
Oxide of iron and alumina	4·42
Lime	0·08
Alkalies, magnesia, &c.	0·25
Phosphoric acid	0·12
Insoluble siliceous matter	91·57
	100·00
Nitrogen	0·117

List of samples analysed on behalf of members of the Society between Dec. 1, 1905, and Nov. 28, 1906:—

Linseed cakes	61
Undecorticated cotton cakes	35
Decorticated cotton cakes	11
Compound feeding cakes and meals	61
Cereals	14
Rice meal	—
Bean and pea meals	2
Dried grains	—
Superphosphates	35
Dissolved bones and compound manures	35
Raw and steamed bones	28
Peruvian guanos	15
Fish, meat, and bone guanos	16
Basic slag	35
Nitrate of soda	7
Sulphate of ammonia	13
Potash salts	9
Shoddy	29
Hoofs and horns	—
Rape and other manure cakes	2
Lime	7
Soot	2
Roots	1
Hay	1
Creosote	1
Cider	1
Waters	80
Soils	19
Milk, cream, and butter	16
Miscellaneous	23
Total	559

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ANNUAL REPORT FOR 1906 OF THE CONSULTING BOTANIST.

During the past year, 208 inquiries from members of the Society were dealt with. So far as these applications testify, it may be said that from the point of view of the Botanical Department the year has been a satisfactory one for the farmer. Most of the inquiries related to the germination and purity of farm seeds. Only twenty-two applications were made by members in regard to diseases in farm crops ; in each case information was given as to the cause of the malady, with advice as to remedial treatment. In fifty-three cases information was given as to the names and properties of unknown plants, and as to the eradication of those that were weeds. Several of the plants had been suspected of having poisoned stock, but no loss of farm animals was brought to the notice of the Botanist from poisoning this year.

Purity and Germination of Seeds.

Forty-seven samples of clovers were examined for purity and germination. Only in one case, a sample of Chilian clover, was dodder found. This is a great improvement in the seed in the market ; it is to be hoped that with continued care the seed of this serious pest may soon disappear from the clover seeds offered to the farmer. The highest percentage in the germination of clovers reached 97 per cent., and the lowest was 80 per cent. ; the average was 90 per cent., representing throughout a good quality of seed. A sample of red clover was remarkable for its purity, for it was quite free from other seeds and had only about $\frac{1}{2}$ per cent. of mineral and vegetable impurities. One sample of home-grown clover consisted of 49 per cent. clover, 47 per cent. rye-grass, the remaining 4 per cent. of bur-parsley (*Caucalis daucoides* Linn.), ribwort (*Plantago lanceolata* Linn.), and vegetable and mineral impurities. This unsatisfactory sample reduced the average purity to 82 per cent. Had this been excluded the average purity would have risen to 94 per cent. The home clover harvest last year was very good. America was supplied with English seed to a considerable extent, and hardly any American-grown seed was on the market, and that little was the remainder from the previous year.

The results of the experiment at Woburn with doddered clover seed may here be noted. The red clover imported from Europe into Chili has been attacked by two different kinds of dodder, neither of which is known in Britain, and these seeds are abundantly present in the Chilian-grown seed. The purpose of the experiment was to determine whether, from not perfecting their seeds or from the climatic changes in our winter, the seeds of the dodder plants would germinate in the second year. The clover with the dodder seeds was sown in the spring of last year. The dodder made its appearance and attacked the clover. This year the clover was quite free from dodder. It would, however, be rash to conclude from this single trial that Chilian dodder seeds do not survive our winters ; it is therefore proposed to repeat the experiment.

The majority of samples examined were grasses. In them the germination reached its highest standard with 97 per cent. in a sample of meadow fescue ; and its lowest was a sample of smooth stalked meadow grass which germinated only 65 per cent. This grass as a rule shows a poor germination, and the 65 per cent. must be considered as satisfactory. It was recommended that three samples of grasses should be rejected because of the presence in them of ergot. The presence of dodder in clover is universally condemned, but little objection is taken to ergot in grass seed. But it will be obvious that ergot is a more serious danger than dodder when we remember that dodder attacks only clover, while ergot may grow on any grass in the field ; and that dodder has a seed of some size and produces an obvious plant which can easily be removed, while ergot has minute spores and its attack may not be noticed.

The highest purity of the grasses was in a sample of rye-grass, which gave 99 per cent., and the lowest was in a sample of meadow foxtail which had only 76 per cent. Foxtail, cocksfoot, red and sheep fescue, tall and golden oat grass usually contain a considerable quantity of empty husks. The farmer is advised to buy these seeds specially by the heaviest bulk or bushel weight. Such seed would of course be somewhat higher in price, but the number of plants that would be produced would much more than compensate for the increased payment.

In regard to seed mixtures sent for examination as to purity and germination, the percentage of the different seeds composing the mixture can be given ; but it is not possible to germinate such a mixture as a whole. Each kind of seed would require to be separated in sufficient quantity to give a reliable result. The only way to appreciate the value of a mixture is by the farmer making it himself, having purchased the different seeds in the proportion he proposes to use them, with a guarantee of purity and germination.

Samples of seeds of mangel, turnip, chicory, yarrow, and other plants were examined. Among these was a sample of broccoli called "Late Queen," which was supplied to a member on conditions specified in the tender, including a guarantee of purity and germination. The sample did not contain a single living seed. Duplicate tests were made which showed that it was entirely dead seed. Externally there was nothing to indicate that the seed was not living. The changes that affect the life of the seed take place within the seed coat, and the vitality of the seed can only be determined when it is tested for germination. The grower can easily determine whether the seed is still living by placing some seeds between the folds of wet blotting paper put on a dinner plate and covered by a small bowl, care being taken to place this in a moderately warm room and to prevent the paper being dried up. A few days will show if the sample consists of live seed.

Among the grass seeds examined this year was one labelled "golden oat grass" (*Avena flavescens* Linn.), which consisted entirely of the seeds of wavy hair grass (*Aira flexuosa* Linn.). The seed of this worthless grass is sometimes sold for golden oat grass, but only the most careless or ignorant seedsman can be imposed upon by this substitution. The hair grass may be used on poor heath land in mountain districts, but in good pastures it is only a weed.

Two samples of oats were submitted as to their value for feeding purposes. They consisted of small but well-ripened grains, and were free from damp or any unpleasant odour, which might cause their rejection by stock. One of the samples was condemned on account of the presence of seeds of corncockle (*Lychnis Githago* Linn.), which when present in any quantity is injurious to chickens and stock.

Duration of Vitality in Farm Seeds.

The obvious importance to the farmer of using only live seed, and at the same time the serious loss to the merchant if the surplus stock of his seed at the end of the season were condemned as worthless, suggested twelve years ago, a series of experiments to determine how many years the various seeds generally used by the farmer retained their vitality under favourable conditions. Thirty-five kinds were obtained from the harvest of 1895, and a sufficient number of these seeds have in the spring of each year since been tested. The trials have been carried on for eleven years, and though it may be two or three years before they are finished, yet the results already obtained are important and instructive. For the purpose of bringing these results before the members of the Society, Mr. Güssow prepared a large diagram which

graphically shows the progress of the experiments up to this year. This diagram was displayed in the Agricultural Education Exhibition at the Society's Derby Show.

The diagram shows that for the first five years all the kinds of seeds produced more or fewer plants. The highest percentage of germination in the fifth year (1900) was made by oats and swedes which gave 98 per cent., and the lowest was met with in hard fescue which was no higher than 5 per cent. During the first and second years this grass germinated 74 per cent. and 71 per cent. In the tenth year thirteen out of the thirty-five samples were dead, and this, the eleventh year, ten more had lost their vitality, making twenty-three in all dead. Of those that survived, black oats germinated 76 per cent. and white oats 57 per cent. Five other samples germinated over 10 per cent., and the remaining five kinds were less than 10 per cent. It will be instructive to publish the results in full when the experiments are completed by the death of all the seeds.

Buttercups in Pastures.

Inquiry was made as to the properties of a plant which was believed to be the cause of scour in calves, giving great trouble in rearing them. The meadow, in which the plant grew in considerable abundance, was marshy. The butter made from the milk of cows which fed in it had a decidedly bitter taste. The plant sent was spearwort (*Ranunculus Flammula* Linn.), and the injuries specified are those which would follow from the eating of this plant. All the species of *Ranunculus*, called buttercups or spearworts, possess acrid properties, and have not the slightest feeding value. They are usually rejected by animals, but young stock not infrequently eat them to their injury. Some farmers like to see buttercups in a field. They consider them to be the sign of a good pasture. They no doubt show that the soil is fitted to grow plants, but every buttercup is a distinct injury to the pasture. Being rejected by the stock they flower and seed in abundance. Their numerous seeds are well protected and remain ready to germinate under favourable conditions. Some of the most acrid increase by creeping stems that run above ground or in the soil. The pasture becomes more and more filled with yellow buttercup, and it loses half its value by the presence of acrid plants which causes every year injury to, if not the death of, some animals. It would be better and more profitable where land is burdened with buttercups to plough it, carefully clean it, take at least one root crop off it, and then sow it with grasses and clover, pure in quality and of good germination. Properly sown down and generously treated, a good feeding pasture has thus been secured within a year of the sowing.

Diseases of Plants.

Comparatively few cases of diseases in plants have during the year been brought to the notice of the Botanist, and these have been mostly described in previous Reports. Cases of clover sickness caused by *Sclerotinia*, of potato canker caused by *Œdomyces leproides*, of bacterial disease in swedes, of scab in pears due to *Fusicladium pyrinum*, and of leaf curl in cherries caused by *Exoascus deformans* have been reported on and treatment recommended.

In the late autumn some apples were received from a member in Worcestershire which had numerous small round shallow depressions on the surface. These are shown in the reproduced photograph. A large crop of valuable apples was

Fig. 1.—Injured apples. One in section.

rendered unsaleable by this injury. When cut each depression in the apple had connected with it a small group of brownish cells, and these patches were found to occur also in the apple away from the skin. There was no trace of bacteria or of any fungus. These brown patches are shown in the apple which is cut through in Fig. 1. The cells in these discoloured spots are somewhat larger than the normal cells, and the cell wall is thickened and dark coloured. Lining the cell wall or scattered through the cell are an abnormal quantity of roundish translucent grains of starch (see Fig. 2). The changed portion gave a distinctly bitter taste to the apple. The member who sent the apples did not detect the injury till after they were stored.

This obscure injury was noticed in 1892 by Jul. Wortmann (*Landw. Jahrbücher*, 1892, Hefte 3 and 4), who gave it the name "Little spots (Stippen) of apples." He considered the malady to be due to a superabundance of an acid in the apple. Dr. C. Brick, of the Pflanzenschutz Station, Hamburg, who has a very extensive acquaintance with imported fruit, writes that he has frequently observed this injury on Australian and American apples. He calls the appearance also "Stippflecke." Dr. Sorauer gives, in his *Handbook of Plant Diseases*, now publishing in parts (pp. 166-169), an account of this malady. He examined the apples carefully, but failed to discover any

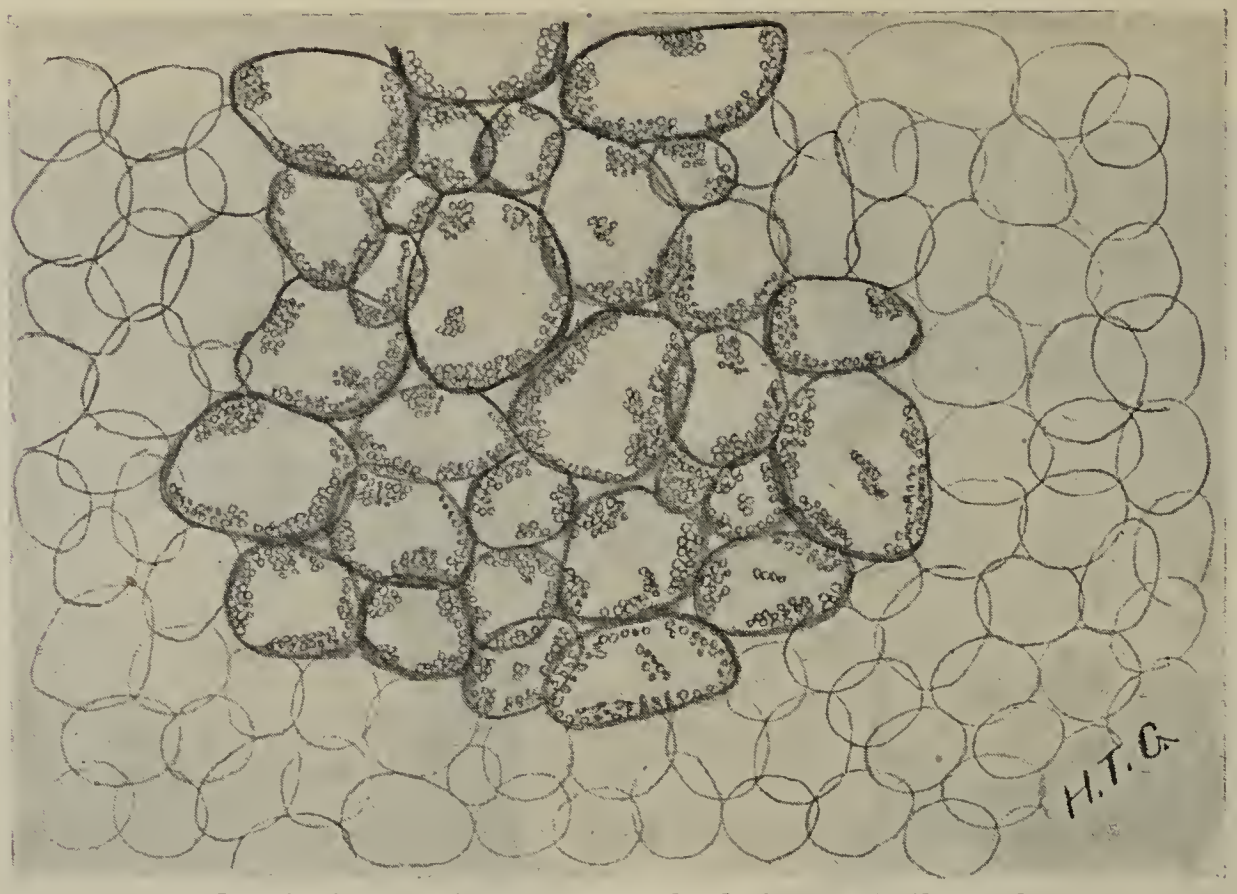

FIG. 2.—Section through one of the dark spots in the apple.

fungus connected with the spots. He shows that in 1904, which was a very dry season on the Continent, the apples were all more or less injured in the same way as those from Worcestershire, especially those which have soft and tender flesh. This is confirmed by the apples sent to the laboratory. They belonged to the varieties "Warner's King," "New Hawthornden," "Lord Grosvenor," and "Allington Pippin"—all soft fleshy fruits. Dr. Sorauer points out that the brown cells in the diseased apples contain quantities of stored food, chiefly along the inside wall. In dry seasons the progress of the sap necessary for the development of the fruit is hindered by the want of water, so that some groups of cells, deprived of their food, become exhausted. The beginning of the injury must be looked for in an early stage of the developing fruit.

He states that this injury is most frequent in orchards which have received nitrogenous manures; and this is confirmed by the reports received by him from farmers.

Accepting Dr. Sorauer's interpretation, which fits in to the conditions under which the injury appeared this year in Worcestershire, when we had an unusually dry summer, it is most desirable that, when the apples are formed, and the moisture in the soil has been consumed during a period of dry weather, there should be given to the trees a supply of water. If this were done by way of experiment in orchards where the apples presented this year the appearance described, and well shown in the reproduced photograph, by watering some trees and leaving others unwatered, important progress would be made towards the successful treatment of this malady.

A serious disease of the pear trees in an orchard in Sussex was investigated. It had been found on all the pear trees. The leaves were covered with numerous bright orange-red patches the size of a threepenny piece, or larger. The parasitic fungus producing this injury is called *Gymnosporangium Sabinæ* Dicks., or commonly pear rust. The fungus was first noticed in June. Under the microscope these patches are found to have numerous small raised pustules of a slightly darker colour than the patch, each of which has a small opening at its apex. The cells of the pustule are thick walled. When ripe, it is found to be filled with small irregularly shaped colourless spores. In September these appear on the under surface of the leaf immediately below the patches; on the upper surface are larger pustules of a reddish colour with an orange coloured apex. This is another phase of the life of the fungus, and is called the æcidium stage. These pustules contain numerous æcidiospores, which escape into the air when ripe. This corresponds to the æcidium stage of the wheat rust fungus which is found on the barberry, and both of these must find another host plant for their further development. The spores of the barberry attack the wheat, and those of the pear grow on *Juniperus Sabina*. They attack the young and tender shoots of the juniper, and form oblong swellings which in the spring throw out golden yellow oblong masses, consisting of spores embedded in mucilage. These find their way to the pear tree and penetrate the young leaf, forming, in time, the orange-red patches. As this history of the fungus is well known, measures for prevention can be suggested. Careful search must be made to get rid of every plant of Sabine's juniper in or near the orchard. If the host plant which produces the spores in spring that germinate on the pear leaves were destroyed, the further attacks would be prevented. Spraying with a weak Bordeaux mixture (say

4 lb. of lime, 4 lb. of copper sulphate or blue stone, and 50 gallons of water) would be beneficial.

Early in the year were received some gooseberry shoots which had died back. These had been attacked by a parasitic mould, *Botrytis cinerea* Pers. The thick greyish cushions of this fungus were protruding through the bark of the dead shoots. There was an abundant production of spores. The member had sent some gooseberries last year which were attacked by this same mould. It destroyed the tissues of the berries just as it destroyed in the following spring the tissues of the young shoots. But the injury was this year much more serious. This fungus is common on any decaying vegetable matter. It can live on dead as well as on living tissues, and it is therefore difficult to deal with. The gooseberry bushes affected had been recently planted, and had not rooted down firmly, but encouraged by the warm spring a good growth had been made. The early autumn of last year probably had not ripened the wood, and the shoots were not able to resist the frost. Plenty of spores of the mould were about from the diseased berries rotting on the ground, and they germinated on the shoots and killed them. The member was advised to remove carefully any affected branches or fruit, put them in a vessel where they would not be carried off by the wind, and burn them. Spraying would be very difficult to perform efficiently.

Some twigs of gooseberry bushes were recently forwarded by the Education Department of the Worcestershire County Council on behalf of a member of the Society. They had been attacked by the fungus, *Sphærotheca Mors-uvæ* Berk. and Curtis, popularly called the American gooseberry mildew. The rusty brown fungus grows on the surface of the young twigs of this year's growth. It obtains its food by sending suckers into the living cells of the bark, and so weakens and distorts the twig. Small globular bodies are developed from the mycelium. These contain a small sac (ascus), enclosing eight spores. This is the winter or rest stage of the fungus (see Fig. 3). At present the whole future of the fungus is in these spores. In the spring the round body bursts, and the sac with its contents escapes. The spores push their way out of the sac, and when they fall upon the young leaves or opening bud of the gooseberry, they send out a fine white thread (mycelium), which grows and branches on the surface of the leaves, and obtains its food also by the suckers it sends into the cells on which it rests. This is the mildew stage of the fungus. From this mycelium are produced simple erect branches, each bearing a single string of ovoid spores. These are produced in great numbers, and give at this stage a powdery appearance

to the leaves. The spores are caught up and carried by the least movement of the air to neighbouring or distant gooseberry bushes, where they sprout, and thus rapidly spread the disease. The mildew also attacks the young berry, usually on one side, and consumes by its suckers the contents of the subjacent cells of the berry. The fruit is distorted and rendered completely useless. Every effort should be made to destroy the diseased tips of the branches before the new life

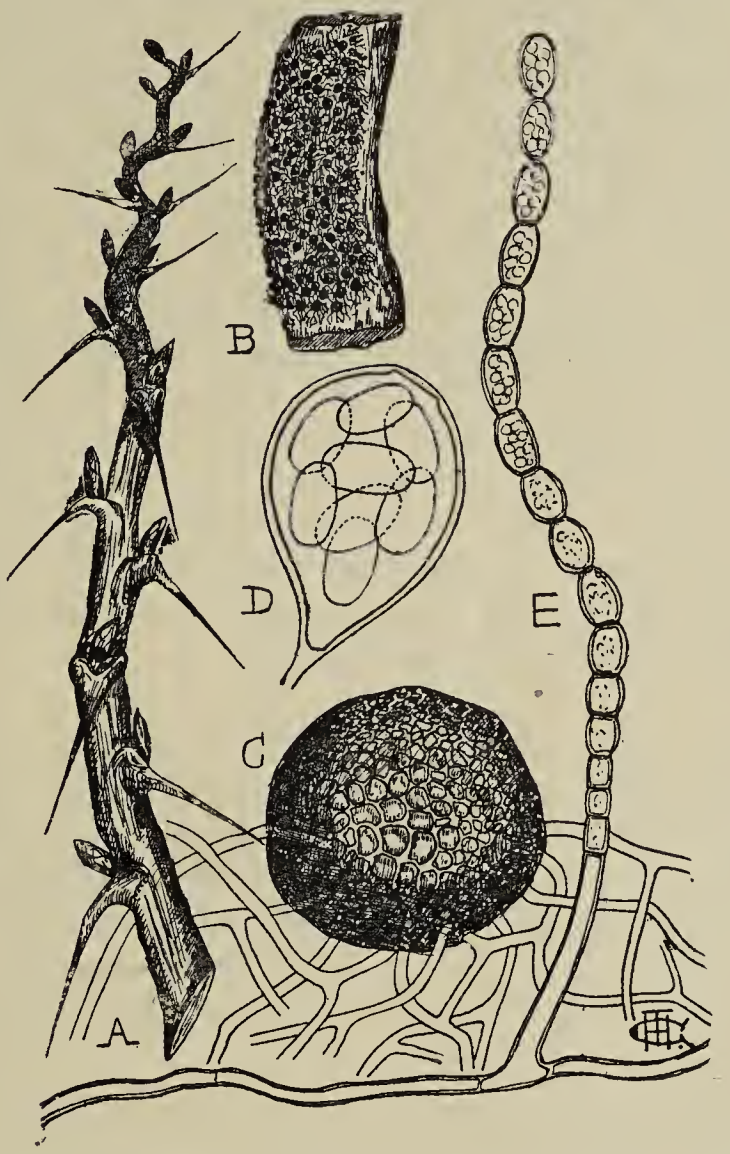

Fig. 3.—The American Gooseberry Mildew (*Sphærotheca Mors-uvæ* Berk. and Curtis).

A, Twig of gooseberry bush, the upper portion attacked and distorted by the fungus. B, A portion of the twig enlarged, showing the fungus. C, The globular body (perithecium) with the mycelium. D, A sac (ascus) with its eight spores. E, A fruiting branch of the mildew stage. A—D are drawn from the specimens received from the Worcestershire County Council. E is after Mr. Salmon, *Journ. R. Hort. Soc.*, 1902, page 600.

begins in spring. The Worcestershire County Council has undertaken, with the approval of the owner, to cut off and burn every infected part in the nursery from which I received the diseased twigs.

The fungus has come to us from the United States, where it is found on wild native species of *Ribes*, and for more than twenty-five years it has done great harm to the cultivated gooseberry (*Ribes Grossularia* Linn.), introduced into the

United States from Europe. The fungus was unknown in Europe until 1900, when Mr. Massee determined that specimens of diseased gooseberries from the north of Ireland, sent to him by Mr. Moore, keeper of the Glasnevin Botanic Gardens, were attacked by the American gooseberry mildew. He announced this in the *Gardeners' Chronicle*, August 25, 1900, figuring and describing the fungus, and suggesting treatment for keeping it in check. Mr. E. S. Salmon (the author of a monograph of the group of fungi to which *Sphærotheca* belongs), having had his attention called by Mr. Massee to the blight appearing in Antrim, published an account of the fungus in the annual volume of the Royal Horticultural Society's Journal, issued in November, 1900. In 1901, the disease was observed in Sweden and Russia, and in November this year (1906), its occurrence in Worcestershire was recorded. Mr. Salmon has most diligently and perseveringly urged that legislative measures be immediately taken to prevent the spread of this disease. Before the disease was detected in the nursery in Worcestershire, many young bushes had been disposed of, and there is reason to fear that these may have carried the infection over a wide area. Since the appearance of the fungus six years ago, the disease has spread extensively in the European localities where it was detected, and it has attacked the gooseberry in other countries of Europe.

Miscellaneous.

The purple orchid (*Orchis mascula* Linn.) was thought by a member to be a dangerous plant, like the meadow saffron. It is, however, quite innocent; the fresh tuber when dried and ground forms salep, which was largely used as a nutritious drink until it was replaced by the more general use of coffee. On the other hand every part of the meadow saffron is most injurious to stock.

A member proposing to undertake the cultivation of Para rubber (*Hevea Brasiliensis*) obtained information as to that plant and its cultivation. Another proposes to cultivate the castor oil plant for the production of oil, and his inquiries were dealt with.

Advice was given as to the methods of cultivation of the sunflower, also for the production of oil. This plant might yield a remunerative crop to the English farmer. It produces a valuable oil and the crushed seeds make a nutritious feeding cake. Unless, however, there are facilities for extracting the oil in convenient oil mills the cultivation of the plant should not be entered upon.

Assistance has been rendered to several public bodies. The seeds for the parks under the management of H.M. Office of

Works have been examined for purity and germination before the purchases were completed. The London County Council have obtained advice for the guidance of the Asylums Committee in connection with the seeds required by them. The Croydon County Council have had guidance as to the treatment of weeds in their parks and recreation grounds, and also of diseased or unhealthy trees. The seeds intended to be sent to the Argentine Republic have been examined and certified as to the presence or absence of injurious weeds.

The Consulting Botanist was unable to be present at the conference of experts in agricultural seed testing from the different countries of Europe and from America, which was held at Hamburg in September. He, however, sent his Assistant, Mr. Güssow, to represent him, and to give information to the members of the conference as to the work done by the Royal Agricultural Society in this department of its operations. Mr. Güssow's Report on his visit is appended.

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INTERNATIONAL SEED-TESTING CONFERENCE AT HAMBURG, 1906.

IN recent years the practice of examining agricultural seeds for purity and germination has made considerable progress in nearly every country. In 1905, at the Vienna International Botanical Congress, it was suggested that a conference should be held of seed-testing experts, and the following year the Hamburg State Botanical Institution issued invitations to a conference, which took place at Hamburg from September 10 to 14, 1906, and which was well attended by experts from different countries. The business of this conference was mainly to consider and arrive at some conclusions as to the best methods for the examination of seeds and to lay down uniform rules of general application.

Dr. STEBLER, of Zürich, opened the proceedings by reading a paper on the methods of determining the country from which imported clover and grass seeds have been obtained. This is of the greatest importance, as it has been proved that seeds from some countries are not suitable for cultivation in other countries. Dr. Stebler stated that the determination depended almost entirely upon the presence of weed seeds in the uncleaned samples. He showed herbarium specimens and samples of weed seeds, which may be called "characteristic seeds," their presence indicating conclusively the country of origin of the seed under examination.

Dr. RITTER von WEINZIERL, of Vienna, referred to modified Austrian methods of testing sugar beet and mangel wurzel seed. These methods depend upon the number of seeds that germinate in a certain weight (15 grains) within six to twelve days, and the calculation is as follows :—100 × the number of seeds that have germinated in that quantity, divided by the number of fruits contained therein.[1]

Dr. RODEWALD, of Kiel, referred to the difficulty of determining the purity of seeds, especially in the finer grass seeds. Generally speaking, the purity of a seed depends upon the absence of all inert matter, weeds, injured or broken seeds of the kind examined, &c. About 200 or 400 seeds from which the impurities have been removed are taken to determine the percentage of germination. Dr. Rodewald pointed out the greater utility of the purity test of the finer grasses by weight. Everything that is not true to name of the kind of seed examined is counted as an impurity, and of the true seeds a certain weighed portion is taken for germination. In this way the great difficulty is overcome, which arises from distinguishing between a glume containing a germinable seed and a glume without one. Other members of the conference suggested reflected light as a better method of determining whether a glume carries a seed or not.

Dr. von DEGEN, of Budapest, dealt with dodder in clovers. He suggested that dodder should be made a subject for international legislation, although this might prove difficult. In dealing with the larger kinds of dodder as found in seeds imported from Hungary and Chili (see page 256) it is important to determine the countries of Europe in which these dodders will grow and ripen their seeds, as it has been stated that dodder from these sources does not ripen its seeds in the northern countries of Europe, like Norway, Ireland, and Scotland, but that in southern England[2] and Sweden the seeds have been known to ripen.

Dr. APPEL, of Dahlem, spoke on the relation of plant diseases to the seed examination, and pointed out the necessity for determining the presence of the micro-organisms of disease in the samples of seeds under examination.

Dr. HILTNER, of Munich, raised the question of germination, speaking on the influence of the quality of water, the kind and

[1] The "seed" of mangels or sugar beet sold commercially as such is botanically the fruit, which contains from 1 to 5 true seeds. Supposing 60 fruits weigh 15 grains and 75 seeds have germinated, the percentage is found by multiplying 75 by 100, which equals 7,500, and dividing it by the number of fruits, *i.e.*, 60, and the percentage found is 125. This indicates that 100 fruits produce 125 seedlings.

[2] I am not aware that dodder from Hungary or Chili has ever been known to ripen its seeds in any part of the British Isles.

degree of moisture of the germinating apparatus, the soaking of seeds previous to germinating, the temperature, presence of light for certain seeds, length of the test, &c. The opinions expressed in the discussion dealt very thoroughly with the subject, though they differed on minor points, like sterilisation of the apparatus, influence of light, &c.

Dr. ALLERBERG, of Kalmar, gave an account of germinating newly harvested seeds of grain crops. It is a well-known fact that such seeds grow very unsatisfactorily when tested immediately after harvest. He succeeded, however, in producing a normal growth by germinating the seeds under low temperature, or after drying them for a few days in a temperature of 104° F.

With the view of organising researches in regard to the questions raised at the conference, a Committee was appointed to report to a further conference to be held in a year or two.

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ANNUAL REPORT FOR 1906 OF THE ZOOLOGIST.

INTRODUCTION.

THE past year, though not marked by the special prevalence of any one pest, has been noteworthy for the wide range which the applications received by the Zoologist have covered. There are very few of the more ordinary injurious insects which have not been complained of in some quarter, while advice has also been asked with regard to several of a less usual description.

Questions concerning many fruit pests have been dealt with, but the points which seem most worthy of mention are the continued spread of the destructive pear midge, and the occurrence in a very severe form of an attack by the currant bud moth (*Incurvaria capitella*), a pest to which attention is not very frequently directed.

Recent discoveries with regard to the spread of certain diseases of domesticated animals through the agency of their external parasites, and especially by the Acarines known as ticks, have made it incumbent on all those concerned with economic zoology to study that little-known group, and a great deal of time has been devoted to their investigation. It has been thought appropriate to give some account of these animals in the following Report.

The cases of corn and root-crop attack presented no feature of special importance. Various enemies of forest trees were the subjects of complaint, and one rather remarkable fact is worthy of mention. A beetle (*Tetropium crawshayi*, Sharp), which was only discovered some two years ago in the New Forest, appears to be quite widely spread in other parts of England, and to be attacking larch trees, often in conjunction with the small wood-wasp (*Sirex juvencus*).

The Currant Bud Moth (*Incurvaria capitella*).

At the beginning of April, I was asked to inspect a red currant plantation in Worcestershire which was suffering, and had for a year or two past suffered, from a severe insect attack. The young shoots had a diseased appearance, and a great many of the buds showed, by the extrusion of little masses of excreta

Fig. 1.—*Incurvaria capitella* and its caterpillar, somewhat enlarged.

on their surface, that some grub was at work within. On cutting open the diseased buds and shoots, small dark-red caterpillars were found, and were recognised as those of *Incurvaria capitella* (Fig. 1). This little moth has been known for a long time as a currant pest, and in 1864 J. G. Wood wrote of it as being "only too common in any places where currants are grown." Nevertheless, I had never before received complaints with regard to it, and the allusions to it by writers on injurious insects are by no means frequent. It would seem that in most cases it is present to so slight an extent as to escape notice, and that it is extremely local as a serious pest. When seen at its worst, however, not even the big-bud mite can exceed its powers of destruction. The Rev. J. B. Hewitt very kindly watched the course of the attack on the spot, and sent me specimens from time to time.

The insect belongs to the extensive family of small moths known as the Tineidæ, of which the clothes moths are familiar examples. It measures rather more than half an inch across the extended wings, and is easily recognised by its distinctive coloration, for the front wings are a dark purple brown, with three bright yellow spots upon them, one completely crossing the wing not far from its base and the other two near the front and hind margin respectively towards the tip. The hind wings are pearly grey and fringed with hairs. Unlike most moths of this group it does not shun the light, but may be seen flying about by day in June.

The attack this year seems to have been earlier than usual, or else to have been noticed at an earlier stage, for the late Miss Ormerod, speaking of its occurrence in Gloucestershire, in 1891, mentioned April 20 as the date when numbers of the shoots were seen to be diseased, and German observers allude to the attack occurring early in May. The time, no doubt, varies somewhat according to the season, but though the summer was exceptionally hot the spring conditions were not such as to lead one to expect any of the April pests to anticipate their time.

The dark-red caterpillars when first seen were about the tenth of an inch long. Some were found in the buds, some in the pith of the shoots, and some wandering on the outside of the twigs. On April 18, Mr. Hewitt wrote: "Here are a few specimens of the pest in its present stage. You will notice that it is doing the same as last year—apparently eating out one bud after another and then establishing itself in the topmost shoot."

Muslin bags were securely tied round some of the infested shoots, and some of these were cut off on April 27 and sent to me. They showed fully fed caterpillars in the act of wandering away from the damaged buds to turn into chrysalids, and some of them had already spun up in the folds of the bag. At the same date it was noticed that such caterpillars as were not stopped by the muslin took refuge under the little flakes of curled bark on the currant stems and there pupated. In this situation fresh chrysalids and the empty skins of those of last year were found.

My specimens gave rise to moths about the middle of May, which again is somewhat earlier than the recorded experience of others, June being the month when the full-grown insect is generally met with.

The moth now seeks the young fruit to lay its eggs, for the caterpillar in its earliest stages feeds upon the pips or seeds. They appear to cause the currants to ripen prematurely, and the infested fruits show red when the majority are still green.

Towards the end of June the caterpillars, still very small (about the twelfth of an inch long), come out of the fruit and the attack is over for the season. In the Gloucestershire attack of 1891 Dr. Chapman caught some of the tiny grubs in the act of emerging from the currants and watched them till they went into winter quarters under the dead scales of old buds, where they covered themselves with a white cocoon and remained inert, only partially grown, until the attack was renewed in the following spring. It appears, therefore, that the moth can pass the whole cycle of its existence without leaving a currant plant, though of course the insect will often select the fruit of a neighbouring bush for the purpose of laying its eggs. It is not, however, yet certain that the winter is always spent upon the currant twigs. It is quite likely that many of the prematurely ripened infested currants may fall to the ground with the caterpillars still within them, and these, when they emerge, must then find some other winter retreat.

A. Schmid says that the "case-caterpillars" (Sackraupen) of *I. capitella* may be found on beeches in winter, and the habit of wandering about with a protective "case" is somewhat characteristic of the near relations of this insect, though it is not stated that the identification was verified by breeding out the moth. This is a point which still demands investigation.

Treatment.—In cases of severe attack it is certainly advisable to cut away and burn the diseased shoots as soon as they show signs of injury, at whatever sacrifice of fruit for the year. If such drastic measures do not seem necessary, there are certain points in the life-history of the pest which suggest possible methods of coping with it, especially in small plantations. The hibernating caterpillars in their cocoons are visible as little white specks at the bases of the buds, and they might perhaps be reached by a winter wash and at all events in part destroyed.

The next vulnerable stage of the insect is that of the chrysalis hidden under the curled bark of the currant stems. Mr. Hewitt thinks that a good deal could be done on the small scale by rubbing down the stems with the gloved hand. This is, of course, only possible between the time when the caterpillars leave the shoots and the time when the moths emerge, and the best time would usually be about the second week in May.

In the third place some advantage might perhaps be taken of the premature ripening of the fruits in which eggs have been laid. If they could be removed and destroyed before the grubs come out to seek their winter quarters it would do much to forestall the attack of the following year.

The red-currant plant is almost always the one to be attacked by this pest, but the black currant is not immune, as cases have been recorded in which it has suffered severely.

Pear Midge (*Diplosis pirivora*).

During the past year this pest has made its appearance in new localities and generally to such an extent as to suggest that it was previously present, but had escaped observation. It is impossible to avoid the conclusion that many fruit growers suffer from it to a slight extent without being at all aware of the fact. This is most unfortunate, because the trouble and expense entailed in exterminating it are comparatively small if its first appearance in an orchard is noticed, but if it obtains a firm hold on the trees the result is sure to be very disastrous.

It is quite natural that a pest should only attract attention when it causes considerable injury, but there are cases when it is desirable not to wait until it thrusts itself thus disagreeably upon one's notice, and surely this is true with regard to the pear midge. Here is a pest whose presence can be easily recognised by any one, and which is at present the cause of great loss to many fruit growers. Moreover, experience has shown that there is a great danger of overlooking it in its early stages. Why wait, then, until a wholesale destruction of pear fruit suddenly compels attention? Nothing is easier than to make a point of examining the pear trees next May whether or not there is any reason to believe they have suffered in the past. There is very little doubt that if fruit growers could be persuaded to do this, the pest would be banished from many an orchard before it had had time to establish itself thoroughly.

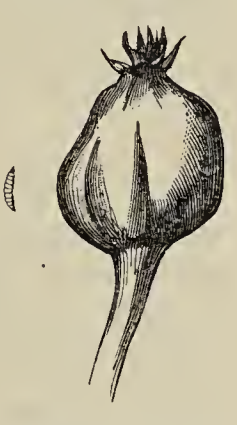

Fig. 2.—Pear infested by pear midge, and one of the maggots.

It is only thirteen years ago since the pear midge was first recorded in England. Now there is scarcely a county in the south of England from which complaints of its ravages have not been received, and it still continues to spread. It threatens rapidly to become not less formidable than the big-bud disease of black currants if nothing is done to check it.

I would ask all who have pear trees to make a point of inspecting them next May shortly after the fruit has set. If all the fruit seems healthy, well and good. But if some of the pears appear stunted and deformed, as indicated in the accompanying figure, they should be picked off and opened. If the pear midge is at work, they will be found to contain numerous white legless grubs, precisely like cheese maggots, and like them, able to jump by applying head and tail together and separating them suddenly.

Perhaps a few such pears will be found only on a single tree, the pest having only just found its way to the orchard. In that case it will be cheaply got rid of if every pear on that particular tree is sacrificed. In any case the owner is warned, and knows of the enemy he has to deal with.

The life-history of the midge has been given in previous Reports, and need not be repeated, but the practical points are these : that during most of the month of May the grubs are in the young pears, and are destroyed by picking off and burning the infested fruit, while at the end of May or in June they leave the fruit and take refuge in the ground, spreading themselves pretty widely through their power of jumping. There they remain till the flies come out in the following spring, so that it should not be impossible to take adequate measures to destroy them, especially if the soil is bare. In grass orchards the matter is, of course, more difficult, but some top dressing might be effectual. Good results have been recorded from a heavy dressing of kainit, though it is not very obvious why it should injure the insect unless by virtue of the common salt which it contains as an impurity.

Apple Trees.

Last spring a diseased appearance of apple branches where they had been pruned the previous autumn attracted attention in a Worcestershire orchard. The affected trees were chiefly " Stirling Castles," and the apparent disease was limited to the short stump between the outermost growing shoot and the place where the branch had been pruned. This appeared swollen and cankerous, and a slight, brown cavity at the tip seemed to indicate that some insect had been at work.

It was impossible at the time to come to any definite conclusion as to the cause of the swellings, but it was hoped that observation of the trees after the next pruning might throw light upon the matter. Unfortunately rather too long a time was allowed to elapse before the newly pruned branches were examined, and nothing was found to account for the phenomenon satisfactorily. In the specimens sent there was again the slight cavity near the tip, covered by a broken and perforated cap, but the evidence of definite gnawing by some grub was not clear. Various creatures were found in the chamber, some of them being obviously casual visitors merely seeking a shelter. The creature most in evidence was the beetle-mite, *Oribata lapidaria*, numbers of which were found in the cavity and also at the bases of the shoots. This is a mite which is constantly accused of causing malformations on the branches of various trees, but the verdict of naturalists is in its favour, as it is said to do good rather than harm by feeding

upon minute fungoid growths parasitic on tree trunks. It has been referred to more than once in these Reports as particularly common on lime trees, and many people remain unconvinced of its innocence.

With this exception, the animals found in the diseased shoots were beyond suspicion, being chiefly mites of carnivorous habits and the aphis-eating grubs of Syrphidæ or "hover flies."

Theobald has described a somewhat similar appearance as being due to the grub of a sawfly of the genus *Emphytus*, but no such grubs were found in this case, nor was there any definite channel such as they would make, and the mystery remains for the present unexplained. It would be interesting to know whether other fruit growers have observed the same phenomenon, and if so, what varieties of apple tree are most affected. Perhaps next year an opportunity will arise of examining the first stages of the diseased growth.

Fortunately no great injury seems to be done to the trees, the swelling being confined to the pruned stump and apparently not interfering with the new growths.

Destruction of Mites by Heat.

In July I was asked to make some experiments with the view of ascertaining the possibility of destroying mites infesting stored material by heat without damage to the material itself. The material in the particular case was tobacco in the form of cigars, and the agricultural importance of this was not at first obvious, but the principle seemed to have a wider application, and the experiments were accordingly made.

It was necessary to employ a thermostat, an apparatus with a chamber which can be raised to any desired temperature and kept steadily at that temperature as long as the operator wishes, and Professor Nuttall kindly placed one at my disposal.

The mite in question was *Glyciphagus spinipes*, one of the Tyroglyphidæ, or cheese-mite tribe, a common species infesting all sorts of stored produce and frequently to be met with in grocers' stores. When the boxes were opened the minute creatures were seen actively running about, but they were quickly out of sight, hidden among the cigars. These showed no sign of injury ; but of course the presence of the mites was objectionable and calculated to diminish the value of the article. Preliminary experiments were made by capturing many of the mites and placing them in glass tubes which were then exposed in the thermostat to various temperatures and for varying periods. They quickly succumbed to a very moderate heat ; indeed, the attempt to ascertain the lowest temperature fatal to them was soon abandoned, for it was realised that this

would almost certainly not suffice to kill the eggs, and this must be done if the treatment is to be of any practical use. Besides, the time taken to heat the interior of a small glass tube to any given temperature would be no indication of that required by so bulky an object as a box of cigars.

The eggs were too small and too difficult to find for individual experiment, and the only practicable method of procedure seemed to be to expose the closed box to a given temperature for a certain time and defer the examination of its contents till any surviving eggs would probably have hatched out into mites.

The details of the experiments, which necessarily extended over several weeks, are of no particular interest, but satisfactory results were not obtained with a temperature less than 66° C. (about 150° F.). In boxes exposed to this degree of heat for half an hour, and opened ten days later, nothing living could be found. The cigars so treated were returned for expert examination, and the verdict was that they had not suffered the slightest injury.

Ticks and Disease.[1]

In December, 1904, Dr. Nuttall wrote :—

> "Ticks and tick-transmitted diseases promise to offer an increasing degree of interest to medical men, zoologists, and those economically concerned. Some of the diseases which ticks transmit . . . are amongst the most devastating which affect domesticated animals in many parts of the world."

The importance of external parasites as transmitters of disease has been brought home to every one by the now classical researches on the connection between malaria and mosquitoes of the genus *Anopheles*. Ticks have been for a long time under suspicion, though until quite recently nothing very definite was proved against them. The ill effects which were believed to result from their bites were attributed to "poisonous properties," and some species, such as the "Mianeh bug" (*Argas persicus*), had a particularly evil reputation.

We now know that in the case of quite a number of ticks the suspicion is only too well grounded ; that besides causing irritating wounds by which septic matter may gain access, they are capable of communicating certain definite diseases from sick to sound animals; that the germs of these diseases may remain alive in the body of the fasting tick for months or years, or may even be present in its eggs and the larvæ to which they give rise, making the second generation no less dangerous than the first.

It is not surprising, in view of recent discoveries, that attention should be seriously directed to this group of external

[1] See also pp. 71 and 86 of this Volume.

parasites, which have hitherto been too much neglected. The study of the diseases themselves is, of course, a pathological matter, and a large number of very able pathologists are now devoting themselves to their investigation. But they naturally look to the zoologist for co-operation. They find certain ticks on the diseased animals, and capable of transmitting the sickness to perfectly sound animals, and they require to know what particular species of tick is in question, its area of distribution, and the details of its life-history. It seems to be the clear duty of all economic zoologists to lend what aid they can, and to relieve the purely medical inquirers as far as possible from the loss of time involved in the investigation of a part of the subject for which their previous experience has not specially fitted them.

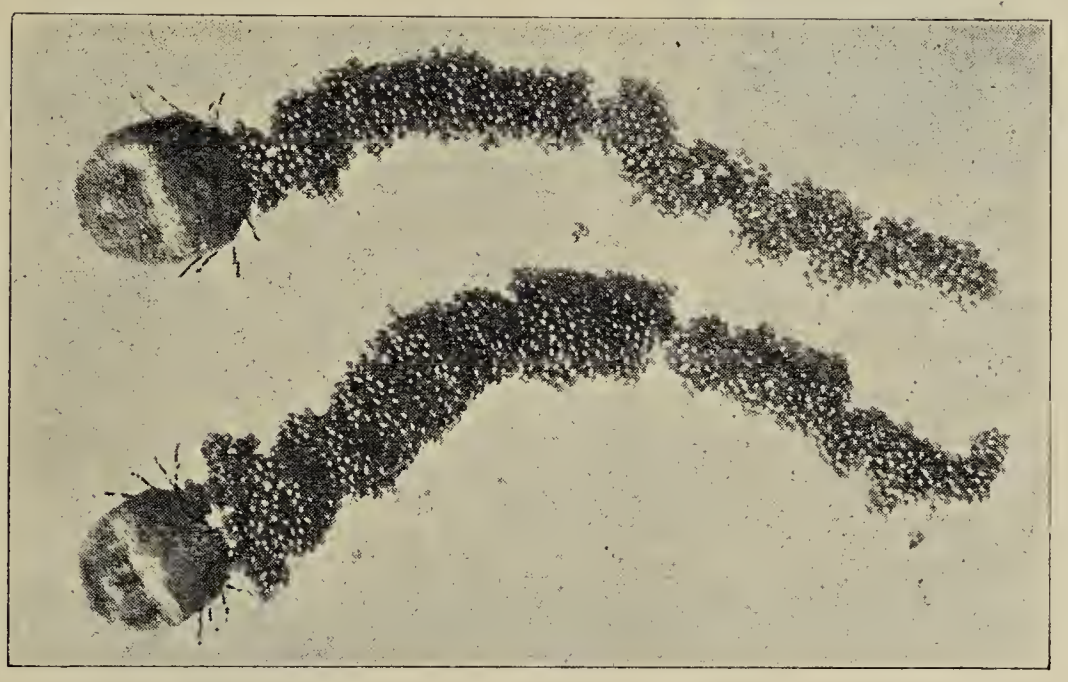

FIG. 3.—Ticks laying eggs.[1]

Holding this view, I thought it advisable to accede to the request of the Government Entomologist of India, that I should examine a large number of ticks collected in that country from domesticated animals in various localities, with a view to their identification. Through the kindness of Dr. Nuttall I have also had access to a large collection of ticks from all parts of the world, and the study of these animals has occupied most of the time not taken up by the routine work of the department during the past summer.

Ticks are members of the great group of Acari or mites. They are, indeed, the most familiar examples of the group,

[1] Figs. 3, 4, 9, and 13 illustrating this paper have been kindly lent by Mr. E. G. Wheler. Figs. 5, 6, 7, and 8 also illustrated this author's article on "Louping Ill and the Grass Tick" in the Journal, Vol. 60, 1899, pp. 626 - 644.

because of their comparatively large size, for mites, as a rule, are extremely minute animals. They are not insects, but Arachnids—a class which includes the spiders and scorpions. When fully grown they have eight legs, but on the way to maturity from the egg they pass through two stages. From the egg a six-legged "larva" hatches out, and this in turn develops into a "nymph," which is eight-legged, but differs in important respects from the adult, especially in being sexually immature.

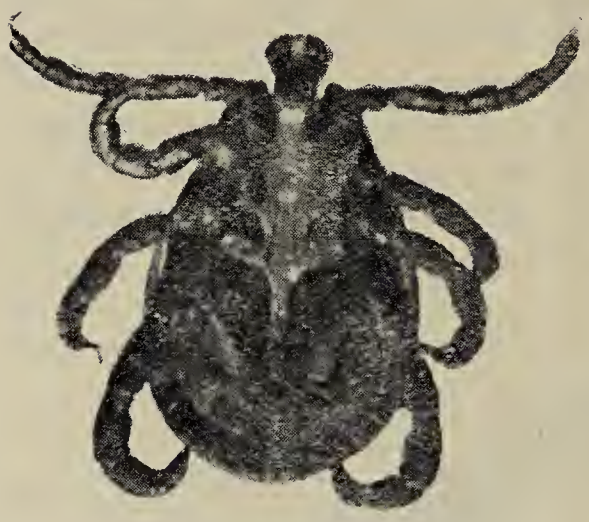

FIG. 4.—Male of *Dermacentor reticulatus* from below, × 10.

The female tick can distend itself to a ridiculous extent by sucking the blood of its "host," and it is not unusual to attain a length of fully an inch, with a proportionate breadth and thickness; though the unfed animal may be considerably less than a quarter of an inch long and as flat as a bug. This distention makes all female ticks look much alike to the inexperienced eye, and to distinguish them the mouth parts, legs and other structures not affected by distention have to be carefully studied. The male tick, on the other hand, is almost entirely covered by an inelastic "scutum" or shield, which prevents it from swelling to any considerable extent, and it is therefore more easily recognised.

The ordinary life-history of a tick is extremely eventful, being spent partly on the "host" and partly on the ground. When gorged, the female drops to the ground, having been previously fertilised by the male while attached to the cow, sheep, or other animal on which it is parasitic. It seeks out a recess in the soil, and proceeds to lay a prodigious number of eggs, sometimes amounting to several thousand, occupying several days in the process. Each egg hatches out, after a period which may extend over days or months according to the temperature, into a tiny six-legged larva, whose further development entirely depends on its success in attaching itself to some passing animal. It may have to wait, fasting, for weeks or months before such good fortune befalls it, and no doubt a large proportion of the larvæ perish without attaining their object. During the waiting period they climb about among the herbage, showing great excitement and activity as any animal approaches, and seizing instantly upon

FIG 5.—Larva of *Ixodes ricinus.*

its hairs as it brushes past. They quickly obtain a secure hold upon the skin, gripping it with the claws with which their feet are well provided, and, plunging in their beaks, greedily begin to suck in the blood. The beak or rostrum is a complicated organ studded with hook-like teeth, which serve to anchor the parasite more firmly ; indeed, if a tick is forcibly removed the rostrum is almost certain to be left behind, often causing a suppurating wound by its continued presence, and it is always desirable to induce a tick voluntarily to release its hold rather than to use violence in removing it.

FIG. 6.—Nymph of *Ixodes ricinus.*

When the larva has filled itself with blood it withdraws its rostrum, unhooks its claws, and drops to the ground, and, crawling into some crevice, remains inert for a varying period, during which the food it has imbibed enables it to advance another stage in its development. When the change is complete, the skin splits and is cast off, and the "nymph" emerges. A blade of grass or a bush is again ascended and the waiting game recommences, for another full meal is necessary before further progress can be made. The whole structure of the animal is wonderfully adapted to the conditions of its life, for its patience is inexhaustible and its ability to continue to live without food amazing, and it is very certain that no chance of attaining another host will be let slip.

FIG. 7.—Adult male of *Ixodes ricinus.*

The nymph, if it be lucky enough to find the animal it seeks, acts as did the larva. When full of blood it releases its hold and falls to the ground again, remaining quiescent until the change to the adult form is complete. Then another moult takes place and the newly emerged male or female once more seeks another host, on which it gorges itself and finds its mate. Eventually the gorged and fertilised female again drops to the ground to lay its eggs, and the life-cycle is accomplished.

The foregoing is a brief account of what is probably the ordinary mode of life of a tick, three different "hosts" being visited in the course of its development. In the case of a few

species, however, it has been found that the changes from larva to adult may be passed through without leaving the skin of the animal to which the tick first gains access.

Ten genera of the Ixodoidea or ticks are now recognised, but before alluding to them in detail it is necessary to indicate certain points of tick structure upon differences in which the classification is founded.

The body of a tick usually has a dorsal shield or *scutum*, covering nearly the whole back of the male, but comparatively very small in the gorged female. The scutum may or may not bear a pair of eyes. There is a kind of false head or *rostrum*—the part which is commonly left behind when the creature is too violently removed. On examination it is seen to consist of a *base*, a pair of *palps*, and a piercing organ consisting of *mandibles* and *hypostome*. The mandibles have toothed projections or *digits* at their extremity, and the hypostome is beset on its under surface with numerous recurved teeth by which the parasite anchors itself (see Fig. 10).

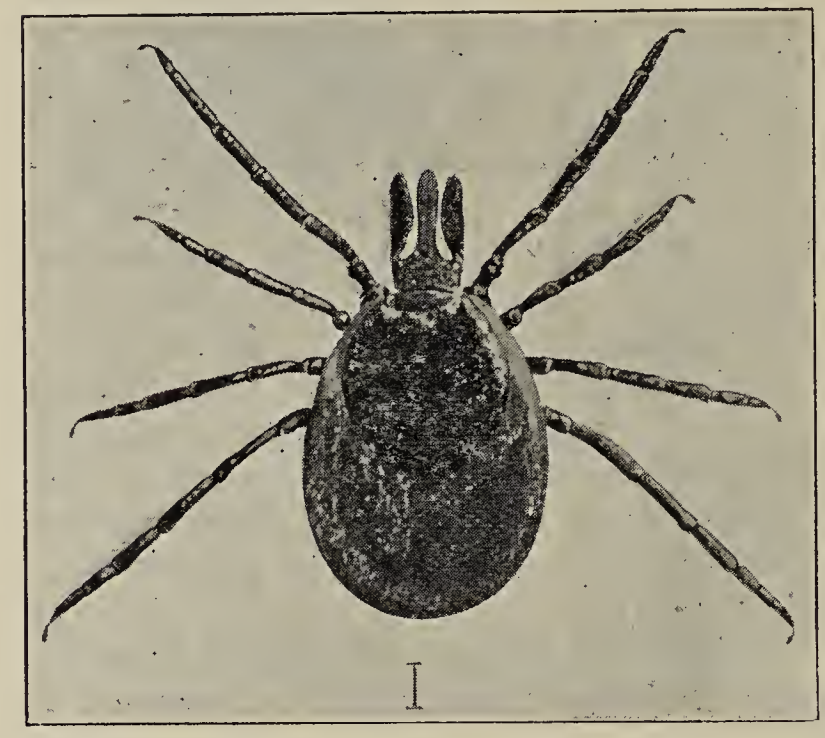

FIG. 8.—Adult female of *Ixodes ricinus*.

The under surface of the body shows the genital orifice somewhat in front, the anus towards the posterior end, and often (in the male especially) certain plates or shields of characteristic disposition. There are always, in the adult, a pair of *stigmata* or breathing apertures, not far from the origin of the last pair of legs. The legs themselves show important characters, their first joints or *coxæ* often bearing peculiar teeth or spines, and their last joints or *tarsi* usually being furnished with a suctorial organ or *pad* for holding on to smooth surfaces, and a pair of claws. All these structures may present generic or specific differences, and there are others which demand attention. For example, there are various grooves and punctations on the body which are constant for the same species of tick, and the hind margin is usually looped or *festooned* more or less distinctly in a tick which is not replete.

Two genera, *Argas* and *Ornithodorus*, differ so much from other ticks that they are placed in a different family, the Argasidæ. They have no scutum, and no pads to their feet when adult. Their integument presents no hard plates, but is leathery in texture, and their mouth parts are more or less on the under surface, instead of being terminal. In *Argas* the rostrum is so ventrally situated that it is completely invisible from above, and the back is studded with numerous more or less symmetrically arrayed circular depressions. There are no eyes. In *Ornithodorus* the rostrum is more in front, so that the palps project beyond the front margin of the body. The skin is roughened by numerous raised spots, and some species possess eyes.

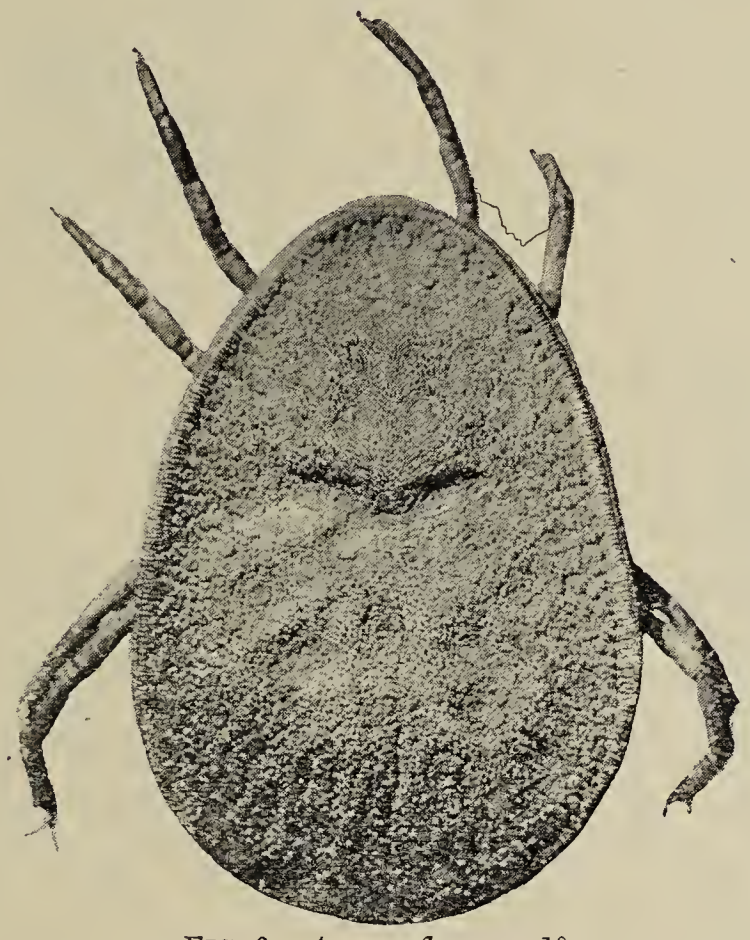

FIG. 9.—*Argas reflexus*, × 10.

Argas persicus has been proved to convey a spirochete disease to fowls, and is believed to communicate it occasionally to man. In South Africa a similar human disease has been traced to *Ornithodorus moubata*.

The remaining eight genera belong to the family Ixodidæ, which may be recognised by the presence of a scutum, and of pads as well as claws on the tarsi. The characters of these genera are briefly given below :—

Rhipicephalus.—Palpi short, flat above ; base of rostrum hexagonal ; eyes present ; anal plates on the male ; stigmata triangular or comma-shaped.

Boophilus.—Palpi very short, with the middle of the second and third joints transversely ridged ; base of rostrum hexagonal ; eyes present ; anal plates on the male ; stigmata circular.

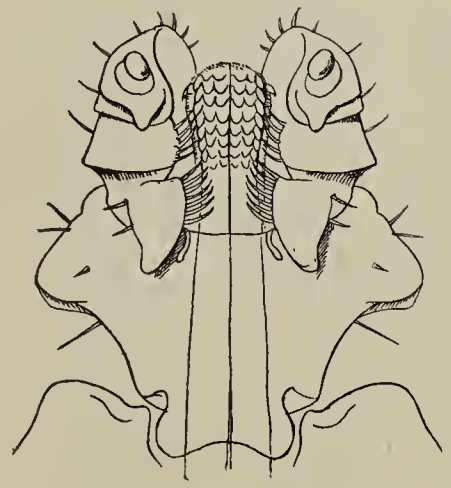

FIG. 10.—Rostrum of *Rhipicephalus appendiculatus*, from below.

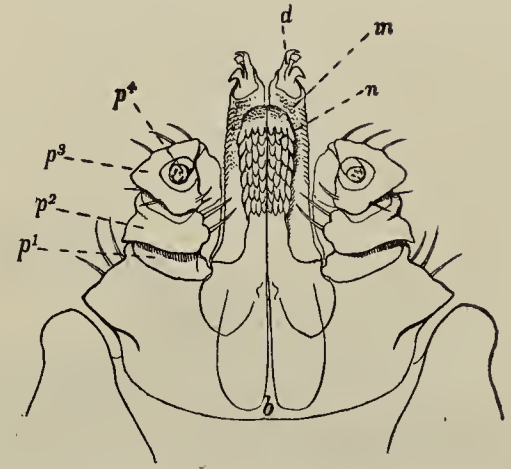

FIG. 11.—Rostrum of *Boophilus australis* from below. *b*, Base of rostrum. p^1, p^2, p^3, p^4, Articles of palp. *m*, Mandible. *d*, Digit. *n*, Hypostome.

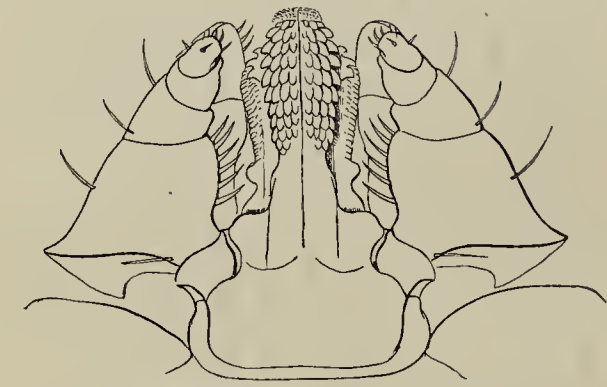

FIG. 12.—Rostrum of *Hæmaphysalis leachi*, from below.

FIG. 13.—Rostrum of *Dermacentor electus*, from above.

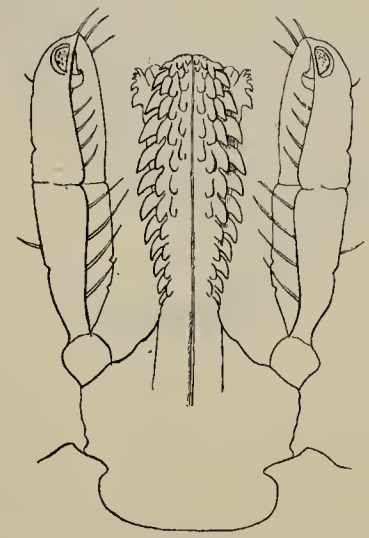

FIG. 14.—Rostrum of *Ixodes ricinus*, from below.

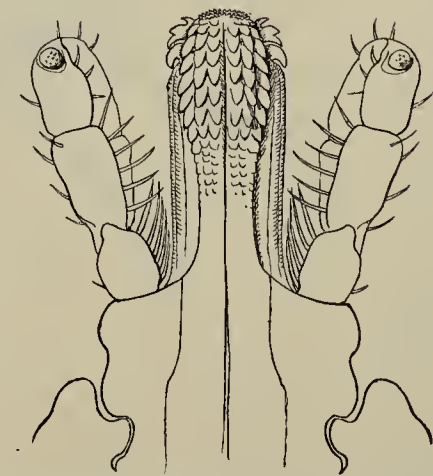

FIG. 15.—Rostrum of *Hyalomma ægyptium*, from below.

FIG 16.—Rostrum of *Amblyomma hebræum*, from below.

Hæmaphysalis. — Palpi short and somewhat triangular, the second joint much projecting laterally ; base of rostrum rectangular ; no eyes or anal plates.

Dermacentor.—Palpi short ; base of rostrum rectangular ; eyes present ; no anal plates ; scutum generally with coloured markings ; coxæ IV of the male much enlarged.

Ixodes.—Palpi long ; base of rostrum somewhat triangular ; no eyes ; male with ventral plates ; stigmata oval ; no festoons.

Hyalomma.—Palpi long ; eyes present ; anal plates in the male ; body long oval ; stigmata triangular or comma-shaped.

Amblyomma.—Palpi long ; eyes present ; no anal plates ; scutum generally with coloured markings ; stigmata triangular.

Aponomma.—Palpi long ; no eyes or anal plates ; body broad oval ; scutum often with metallic spots.

As ticks of the genus *Aponomma* live almost exclusively upon reptiles, they are without economic importance. All the other genera furnish species which are either proved to be, or are suspected of being, the agents in transmitting diseases to domesticated animals.

The following diseases have been definitely traced to ticks:—

Texas fever or redwater in cattle, prevalent in Europe, Asia, Africa, North and South America, and Queensland. It is conveyed by ticks of the genus *Boophilus.*

Rhodesian fever in cattle is communicated by *Rhipicephalus appendiculatus.*

Carceag, a European sheep disease, is spread by *Rhipicephalus bursa.*

Heartwater, which affects sheep and goats in South Africa, has been traced to the " bont tick," *Amblyomma hebræum.*

Canine piroplasmosis in various parts of the world is certainly conveyed by two ticks, *Rhipicephalus sanguineus* and *Hænaphysalis leachi* ; and other ticks are suspect, especially the English tick, *Ixodes ricinus.*

Spirochæte disease in fowls, and probably also in man, is conveyed by *Argas persicus.*

Spirochæte disease in man in South Africa has been traced to *Ornithodorus moubata.*

In these cases the chain of evidence is complete. Dogs in England bitten by adult ticks of the species *H. leachi*, taken from diseased dogs in South Africa, develop piroplasmosis within three weeks, and die of that disease. In the case of Rhodesian fever the infected larva of *R. appendiculatus*, communicates the disease after becoming a nymph, and the infected nymph after becoming adult. The Texas fever ticks not only convey the disease in all stages, but their very eggs are infected, and the young which hatch out may infect the first cattle they attack. In other cases a remarkable correspondence has been observed between the distribution of the tick and that of the disease, but the last link in the chain of proof—the infection of sound animals by infected ticks from another part of the world—is still wanting.

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THE WOBURN EXPERIMENTAL STATION OF THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

	PAGE
FIELD EXPERIMENTS, 1905 AND 1906	282
CONTINUOUS GROWING OF WHEAT, 1905	282
" " " 1906	286
CONTINUOUS GROWING OF BARLEY, 1905	288
" " " 1906	290
ROTATION EXPERIMENTS, 1905 AND 1906	291
GREEN-MANURING EXPERIMENT, 1905 AND 1906	299
"HEAD" AND "TAIL" BARLEY, 1905	301
CANADIAN WHEAT, 1905 AND 1906	302
SOOT AS A TOP-DRESSING FOR WHEAT, 1905	304
POTASH MANURING FOR POTATOES, 1905	305
NITRATE OF SODA AND SALT FOR MANGELS, 1905 AND 1906	306
EXPERIMENT ON LATE-PULLING OF MANGELS, 1906	307
LUCERNE, 1905 AND 1906	308
VARIETIES OF LUCERNE, 1906	309
VARIETIES OF CLOVER, 1906	309
RAINFALL AT WOBURN, 1905 AND 1906	310

FIELD EXPERIMENTS.

CONTINUOUS GROWING OF WHEAT (*STACKYARD FIELD*), 1905 (29TH SEASON).

THE land, after being cultivated, ploughed, and cleaned, was drilled on October 14, 1904, with "Square Head's Master" wheat at the rate of 9 pecks per acre. The soil was in capital condition and the seed went in well. Mild weather following, the wheat began to show on October 28. A week later it was well up on most of the plots, but already the failure of plots 2a, 5, and 8 (on which ammonia salts had been continuously used) was marked. On the contrary, plot 2b, to which lime in addition had been given in December, 1897, showed up favourably. Owing to windy weather the application of mineral manures was delayed until November 5.

The application of lime to plot 2b of the continuous wheat series, as also in the case of plots 2b, 5b, 8aa, and 8bb of the continuous barley series, having produced such striking results, it was decided, now that the other plots (5 and 8, on which ammonia salts had been used) had begun to show failure of crop, to extend the experiment with liming. On plot 2b, lime had been put on in December, 1897, at the rate of 2 tons per

acre. This dressing, it must be allowed, is a considerable one, and, though here justified, it can well be understood that the cost of it might make the ordinary farmer hesitate. It was therefore thought desirable, in extending the liming experiment, to endeavour to ascertain whether smaller applications of lime might not be efficacious : accordingly, the new scheme was made to include applications of 5 cwt. (plot 2aa), 10 cwt. (plots 8aa and 8bb), and 1 ton (plot 5b) per acre, as well as a repetition of the 2 tons per acre on plot 2bb. The lime used contained 79·34 per cent. of lime (CaO). It was bought ground, then slaked with water under cover, left for a few days to crumble down, then carted out and spread on the land and harrowed over. These various dressings were given on January 19, 1905. It was not expected that any result would be noticed in the crop of 1905, as the lime would necessarily take some time to work. Farmyard manure, made as usual in the feeding boxes by bullocks, was spread on plot 11b on February 18, and rape dust on plot 10b on February 20. Cold weather followed upon this and made the crop appear very limp.

The nitrogenous top-dressings were applied, the first halves of the heavier dressings on April 17, and the second halves and single dressings on May 15. The different plots came on very fairly except 2a (ammonia salts only), which was almost bare, and presented quite a contrast to 2b which had had the same treatment with lime in addition. Heavy rains fell early in June and the wheats were all in bloom by June 24, after which, under the influence of dry weather, they ripened fast towards the end of July. On August 14, they were cut, and were carted on August 24, being finally threshed and weighed on November 3, after which the corn was valued by an expert.

The general yield was an average one and much in excess of that of 1904. The unmanured produce was $14\frac{1}{4}$ bushels per acre (plot 7, this being the more reliable owing to the influence of surrounding trees on plot 1) as against 7·4 bushels in 1904. The highest yield was from plot 11b (farmyard manure), 32·45 bushels, the biggest crop with artificial manures being 26·57 bushels (plot 9a). Ammonia salts alone (plot 2a) gave no crop worth reaping, but with the lime (2 tons applied once, December, 1897) yielded just over 10 bushels, which was as much as nitrate of soda alone gave. The gradual diminution of crop with nitrate of soda is noticeable and points to still further interesting results being forthcoming in the future. Used with mineral manures, ammonia salts (plot 5) gave a higher yield than did nitrate of soda (plot 6). When, however, heavier dressings of the salts were used (plots 8a and 9a) the ammonia salts showed the same signs of failure as they did on plot 2a,

TABLE I.—*Continuous Growing of Wheat, 1905 (29th Season), and 1906 (30th Season).*

(Wheat grown year after year on the same land, the manures being applied every year.)

Stackyard Field—Produce per acre.

Plot	Manures per acre	1905					1906				
		Head corn		Tail corn	Straw, chaff, &c.	Value per quarter on basis of 29*s.*	Head corn		Tail corn	Straw, chaff, &c.	Value per quarter on basis of 27*s.* 6*d.*
		No. of bush.	Wgt. per bush.	Weight			No. of bush.	Wgt. per bush.	Weight		
			Lb.	Lb.	C. q. lb.	*s.* *d.*		Lb.	Lb.	C. q. lb.	*s.* *d.*
1	Unmanured	4·8	58·0	28	7 0 9	27 0	9·3	62·5	30	8 0 15	26 6
2a	[1] Ammonia salts (containing 50 lb. ammonia)	No crop					3·4	56·0	16	4 1 20	26 0
2aa	As 2a, with 5 cwt. lime, Jan., 1905	No crop					19·2	62·5	32	16 0 25	26 6
2b	As 2a, with 2 tons lime, Dec., 1897	10·2	60·0	53	9 1 0	28 6	26·1	61·5	60	20 1 8	26 6
2bb	As 2b, with 2 tons lime (repeated), Jan., 1905	8·9	58·0	69	8 0 16	27 0	25·5	58·5	116	22 2 12	25 0
3	Nitrate of soda (containing nitrogen = 50 lb. ammonia)	10·2	55·4	188	14 2 8	26 0	23·0	58·2	144	22 3 11	25 0
4	[2] Mineral manures	9·3	57·5	72	9 3 10	28 0	6·8	60·2	26	7 0 25	26 0
5a	Mineral manures and ammonia salts (containing 50 lb. ammonia)	25·2	58·5	57	19 3 4	27 0	31·5	62·4	62	22 0 8	26 6
5b	As 5a, with 1 ton lime, Jan., 1905	19·4	60·5	97	18 2 16	29 0	31·0	63·5	60	19 3 4	27 0
6	Mineral manures and nitrate of soda (containing nitrogen=50 lb. ammonia)	21·2	57·7	211	22 3 10	28 6	21·2	60·0	133	18 1 22	26 0
7	Unmanured	14·2	60·7	143	12 3 21	28 6	11·5	61·2	28	8 2 24	26 6
8a	Mineral manures and (in alternate years) ammonia salts (=100 lb. ammonia)	8·4[3]	60·0	40	9 2 12	29 0	10·6[4]	56·0	24	8 2 24	25 6
8aa	As 8a, with 10 cwt. lime, Jan., 1905	14·2[3]	60·0	65	11 1 24	29 0	21·4[4]	62·2	40	15 0 20	26 6
8b	Mineral manures, ammonia salts (=100 lb. ammonia) omitted (in alternate years)	10·2[4]	60·0	48	9 1 0	28 6	28·0[3]	62·0	48	21 2 0	27 0
8bb	As 8b, with 10 cwt. lime, Jan., 1905	18·2[4]	62·0	97	14 1 24	29 6	34·7[3]	62·2	44	23 2 20	27 0
9a	Mineral manures and (in alternate years) nitrate of soda (containing nitrogen = 100 lb. ammonia)	26·6[3]	58·5	203	27 1 10	28 6	7·4[4]	60·0	24	8 0 0	26 0
9b	Mineral manures, nitrate of soda (containing nitrogen = 100 lb. ammonia) omitted (in alternate years)	15·3[4]	60·7	109	13 2 16	29 0	35·2[3]	61·5	204	35 0 22	26 6
10a	1889, rape cake (=50 lb. ammonia). No manure since	12·1	59·2	59	10 1 10	29 0	15·9	61·0	26	12 0 4	26 6
10b	Rape cake (=100 lb. ammonia) every year since 1890	20·2	60·5	128	19 3 24	29 0	34·5	63·0	56	28 3 22	26 6
11a	1877-81, farmyard manure (=200 lb. ammonia). No manure since	16·3	61·9	88	15 1 20	29 0	13·6	61·2	48	10 3 4	26 6
11b	Farmyard manure (= 200 lb. ammonia) every year	32·4	61·9	161	32 1 0	30 0	16·2	61·2	28	17 1 4	26 6

[1] Ammonia salts are equal weights of sulphate of ammonia and muriate of ammonia.
[2] Mineral manures are, throughout, 3½ cwt. superphosphate of lime, 200 lb. sulphate of potash, 100 lb. sulphate of soda, 100 lb. sulphate of magnesia per acre.
[3] Applied. [4] Omitted.

TABLE II.—*Continuous Growing of Barley*, 1905 (*29th Season*), *and* 1906 (*30th Season*).

(Barley grown year after year on the same land, the manures being applied every year).

Stackyard Field—Produce per acre.

Plot	Manures per acre	1905					1906				
		Head corn		Tail corn	Straw, chaff, &c.	Value per quarter on basis of 28*s*.	Head corn		Tail corn	Straw, chaff, &c.	Value per quarter on basis of 27*s*.
		No. of bush.	Wgt. per bush.	Weight			No. of bush.	Wgt. per bush.	Weight		
			Lb.	Lb.	C. q. lb.	*s*. *d*.		Lb.	Lb.	C. q. lb.	*s*. *d*.
1	Unmanured	20·0	53·4	45	12 0 2	25 0	12·3	51·7	26	7 0 15	23 0
2a	[1] Ammonia salts (containing 50 lb. ammonia)	—	—	8	0 2 5	23 0	—	—	1	0 1 0	22 6
2aa	As 2a, with 5 cwt. lime. March, 1905	9·7	50·0	65	7 0 0	25 0	11·6	48·0	20	5 3 12	23 0
2b	As 2a, with 2 tons lime, Dec., 1897	23·7	52·0	97	14 2 16	24 6	25·4	53·0	60	10 1 16	23 0
2bb	As 2b, with 2 tons lime (repeated), March, 1905	28·2	51·7	227	19 2 4	24 0	38·5	52·8	96	18 2 8	23 0
3	Nitrate of soda (containing nitrogen=50 lb. ammonia)	17·9	51·4	89	12 0 1	23 0	36·3	52·8	81	19 2 14	23 6
4	[2] Mineral manures	23·3	53·5	60	13 1 11	26 0	18·8	51·8	20	9 2 18	23 6
5a	Mineral manures and ammonia salts (containing 50 lb. ammonia)	3·9	52·0	16	3 0 4	26 0	1·7	52·0	3	0 3 9	23 6
5aa	As 5a, with 1 ton lime, March, 1905	3·9	52·0	8	2 3 0	25 6	33·9	55·5	48	16 0 0	25 0
5b	As 5a, with 2 tons lime, Dec., 1897	40·6	54·1	96	24 2 12	26 0	44·3	54·5	48	21 1 6	26 0
6	Mineral manures and nitrate of soda (containing nitrogen=50 lb. ammonia)	30·0	52·5	117	19 2 10	24 6	47·5	53·6	48	27 0 0	25 6
7	Unmanured	18·7	52·5	62	10 2 4	25 6	17·5	51·2	29	8 2 16	23 6
8a	Mineral manures and (in alternate years) ammonia salts (=100 lb. ammonia)	2·8[3]	52·0	49	2 1 12	26 0	3·4[4]	52·0	4	2 2 10	23 6
8aa	As 8a, with 2 tons lime, Dec. 1897	36·7[3]	54·7	126	23 1 16	25 6	28·6[4]	53·2	24	15 1 8	26 0
8b	Mineral manures, ammonia salts (=100 lb. ammonia) omitted (in alternate years)	6·6[4]	52·0	20	4 1 24	26 6	11·8[3]	56·0	16	6 2 9	23 6
8bb	As 8b, with 2 tons lime, Dec., 1897	36·1[4]	53·8	97	21 1 8	26 6	38·2[3]	54·3	48	20 3 0	25 6
9a	Mineral manures and (in alternate years) nitrate of soda (containing nitrogen = 100 lb. ammonia)	32·3[3]	52·6	148	21 1 0	24 6	32·9[4]	53·7	36	18 1 16	26 0
9b	Mineral manures, nitrate of soda (containing nitrogen = 100 lb. ammonia) omitted (in alternate years)	18·1[4]	53·1	59	11 1 0	25 0	60·8[3]	52·4	120	42 1 7	23 0
10a	1899, rape cake (=50 lb. ammonia). No manure since	21·9	53·6	90	11 2 12	26 0	23·1	52·0	32	12 2 6	23 6
10b	Rape cake (=100 lb. ammonia) every year since 1890	34·0	52·1	184	22 3 12	23 0	45·8	52·4	56	24 1 18	23 6
11a	1877-81. farmyard manure (=200 lb. ammonia). No manure since	32·1	53·5	96	16 0 14	26 6	26·5	53·5	30	14 3 24	25 0
11b	Farmyard manure (= 200 lb. ammonia) every year	42·6	54·3	118	26 0 18	26 6	45·6	55·3	42	27 0 20	25 0

[1] Ammonia salts are equal weights of sulphate of ammonia and muriate of ammonia.

[2] Mineral manures are, throughout, 3½ cwt. superphosphate of lime, 200 lb. sulphate of potash, 100 lb. sulphate of soda, and 100 lb. sulphate of magnesia per acre.

[3] Applied. [4] Omitted.

whereas the nitrate of soda did not. As usual, nitrate of soda gave comparatively the larger yield of straw. The need of liming plot 8 was thus emphasised. Plot 4 (minerals only) was not reliable owing to increasing overgrowth of trees. The result from rape cake (plot 10b) was not equal to that from farmyard manure (plot 11b).

Though the lime applied to the new plots 2aa, 2bb, 5b, 8aa, and 8bb, could hardly be said to have got into full action, it is worthy of note that while the 5 cwt. on plot 2aa effected no change, the application of 2 tons on plot 2bb and of 1 ton on plot 5b seemed temporarily to retard the crop. On the other hand the 10 cwt. on plots 8aa and 8bb gave a distinct increase of 14 to 18 bushels of corn, besides markedly improving its quality. The rainfall for the year was 19·31 in.

When the corn was valued, it was found that farmyard manure gave not only the largest crop, but the best quality, while nitrate of soda alone (plot 3) was the poorest quality of all. It is specially noticeable that plots 3, 6, and 9 (on all of which nitrate of soda was used) gave the highest proportion of tail corn, as also the lowest weight per bushel. On the whole, the wheat from the farmyard manure and rape cake plots was the best, and then came that from the ammonia plots, where lime in addition had been used. The wheats were, taken together, much better than the barleys of the same year, and the five lots that stood highest in the valuation were above the average of the wheats of the district. The complete results are given in Table I., page 284.

1906 (30th Season).

The details of cultivation, &c., were much as just recorded for 1905. The rainfall for the year was 25·23 in., as against 19·31 in. in 1905. A good deal of rain (3·06 in.) fell in January (which had been a dry month in 1905), as also in February and March (1·69 in. and 1·67 in. respectively). As in 1905, there was a great deal of rain in June (3·48 in.), but July was very hot and dry, and brought the crop early to maturity.

The seed, "Square Head's Master," obtained from Yorkshire, was drilled at the rate of 9 pecks per acre, on October 11, 1905. The ammonia plots (2, 5, 8), as usual, looked much poorer than the rest, of which plot 11b (farmyard manure) showed most prominent, then plot 10b (rape cake). Plot 3 (nitrate of soda alone) at this stage looked inferior to the other nitrate plots (6 and 9) where minerals as well had been used. Already at this point the influence of the small dressing of 5 cwt. of lime to plot 2aa had made a wonderful difference as compared with the unlimed plot 2a, but the repetition of the 2 tons of lime on plot 2bb did not seem to make it any better than plot

2b, which was last limed in 1897, and which looked exceptionally well. The ground being very sodden in November, mineral manures could not be applied until December 18. Rape dust was put on plot 10b, and farmyard manure on plot 11b, on March 2, 1906, and the nitrogenous top-dressings on April 11 and May 14. At the latter date the most striking feature was the effect, on plot 2aa, of the single application (the year before) of 5 cwt. of lime. The influence of lime was also marked in plots 8aa and 8bb, as compared with the similar unlimed plots. By the close of June the best plot of all was undoubtedly 10b (rape dust), and, by way of contrast, the farmyard manure plot (11b) was very disappointing. This continued throughout the season, and the plot yielded very badly, not giving half the crop that the rape cake did (16·2 bushels, as against 34·5). It is very difficult to assign any adequate reason for this abnormal result, for the dung was of quite as good quality as in other years, and made and applied in the same way. The fact, however, remains, and was a common matter of observation by visitors to the farm throughout the season. "Rust" began to make its appearance towards the end of June, and was most marked on the nitrate of soda plots. The plots were cut on August 9, carted August 15-17, and threshed and weighed on November 15, the corn being subsequently valued by an expert.

The general yield was similar to that of 1905 and up to the average of the first twenty years. The unmanured produce (plot 7) was $11\frac{1}{2}$ bushels per acre, and the highest yield 35·2 bushels (nitrate of soda and minerals), this being closely followed by ammonia salts and minerals including 10 cwt. of lime, and by rape cake (34·7 and 34·5 bushels respectively), nitrate of soda, however, giving the more straw. The poverty of the farmyard manure plot (11b) has been commented on; the yield was only 16·2 bushels, as against 32·45 bushels in 1905. Another anomaly is that with plot 3 (nitrate of soda only), which, though it looked at one time distinctly inferior, gave 2 bushels more corn than the same amount of nitrate with minerals (plot 6). The effects of these anomalies can only be eliminated, or their causes explained, by a long series of experimentation and observation such as is pursued at Woburn. While ammonia salts alone (2a) produced but $3\frac{1}{2}$ bushels, the effect of 2 tons of lime put on in 1897 was to increase this (2b) to 26·1 bushels and to exceed by 3 bushels the yield from nitrate of soda alone (plot 3). Even the 5 cwt. of lime put on plot 2aa in 1905 raised the produce to 19·2 bushels, and the remarkable appearance of this plot as compared with plot 2a was a perfect "object lesson" to the many visitors who came to the farm.

It was almost incredible that so great a change could be effected in so short a time by the application of a mere "sprinkling" of lime, and this alone justified the departure that was made in 1905 and the greater complexity of the plots involved thereby. On the other hand, the repetition of 2 tons of lime in 1905 (plot 2bb) did not seem called for, and it has been, accordingly, made clear by these experiments that the influence of a dressing of 2 tons of lime to the acre will last, with corn crops, for at least nine years. Similarly, the application of 1 ton of lime to 5b did not increase the yield, but it has to be remembered that plot 5a was exceptionally good this season. Ammonia salts (heavy dressing) with minerals, including lime, took the produce to 34·7 bushels (8bb), practically equalling that from the heavy nitrate of soda dressing with minerals (9b). The omission of nitrate of soda for a single year (9a) resulted in a fall to 7·4 bushels (9a), the decline, when ammonia salts were similarly left out (8aa), but lime used, being nothing like so great, viz., to 21·4 bushels. As remarked before, plots 1 and 4, are both, through the influence of overshadowing trees, unreliable. The full returns are given in Table I., page 284.

The same features as in 1905 of large quantity of tail corn, together with low weight per bushel, resulting from the use of nitrate of soda (plots 3, 6, and 9), are noticeable. The best weight per bushel was given by rape cake (10b) and ammonia salts with lime (5b). Lime, when applied, seemed generally to improve the weight per bushel. The wheats were only of medium quality and, with three exceptions, did not come up to the average samples of the district. The highest prices were obtained with ammonia salts and minerals with lime; rape cake and farmyard manure were not much behind, while nitrate of soda gave the lowest prices, the wheat not being good enough for milling purposes.

Continuous Growing of Barley (*Stackyard Field*), 1905 (29th Season).

The land was prepared through the winter and ploughed a second time, March 1-3, 1905. "Hallett's Chevalier" barley was drilled on March 10, at the rate of 10 pecks to the acre. At the same date lime was applied to plots 2aa, 2bb, and 5aa in the same way as with the continuous wheat plots. Very stormy weather followed and it was not until March 17 that the mineral manures could be put on, as also the rape dust (plot 10b), farmyard manure going on to plot 11b still later (March 21). The nitrogenous top-dressings were applied, the first halves of the heavier dressings on April 17, and the second

halves and single dressings on May 15. Although no result was expected so early from the use of lime it certainly did appear as if that put on plots 2aa and 5aa had caused some improvement. Heavy rains early in May affected the plant considerably, as did also an attack of wireworm; this latter was least marked on the rape cake plot (10b). The barley came into ear by June 19, and the several plots were cut August 25-26 and carted on September 1, the crop, however, being much damaged by rain, which fell heavily on August 28-29. The corn was threshed out on November 3, and subsequently valued.

The crop, though much damaged in regard to quality by the rains that fell at harvest time, was a much heavier one than that of 1904 and was not much below the average of the first twenty years. Thus, the unmanured produce was 19·35 bushels per acre as against the average of 21 bushels, and mineral manures alone gave 23·3 bushels (average 22·5 bushels). Farmyard manure, as with the wheat, produced the heaviest crop, viz., 42·6 bushels, while 40·6 bushels were reached with a dressing of artificials comprising mineral manures, ammonia salts, and lime (plot 5b), no lime, however, having been put on since 1897; while ammonia salts alone gave no crop, the same with lime (1897) but no minerals yielded 23·7 bushels, or in excess of the produce from nitrate of soda alone (17·9 bushels). Even when used with minerals (plot 6) nitrate of soda failed to give as good a crop as did ammonia salts with minerals and lime (30 bushels as against 40·6). Rape cake produced the satisfactory yield of 34 bushels. In regard to the newly limed plots it may be noted that, though so recently applied, the 5 cwt. on plot 2aa produced nearly 10 bushels of corn where before none had grown, and on plot 2bb an increase of 4½ bushels. On plot 5aa, however, where 1 ton had been applied, no benefit accrued. The crop returns and other particulars are set out in Table II., page 285.

The quality of the corn was much deteriorated owing to the unfavourable conditions ruling at the time of harvest. As with the wheat, so here, farmyard manure gave the highest produce and the best quality, while nitrate of soda gave the worst quality of all.

As had been the case with the wheat, the lowest weight per bushel was given with nitrate of soda (plots 3 and 9), and the best with ammonia salts (and lime), rape cake, and farmyard manure. The best samples were not more than would pass as low class malting barleys, for which, however, owing to high prices ruling for foreign barleys, there was at the time a good demand, and so the differences in price are not so marked as otherwise would have been the case.

1906 (30TH SEASON).

"Chevalier" barley was drilled at the rate of 9 pecks per acre on April 4, 1906, farmyard manure to plot 11b and rape dust to plot 10b being put on just afterwards. Mineral manures were applied on April 26, and nitrogenous top-dressings on May 14 and 29. The crop suffered but little from the heavy rains at the end of June. The newly limed plots at this period bid fair to give very interesting results, for, while plot 2a (ammonia salts only) was almost bare, the 5 cwt. of lime on plot 2aa showed a clear difference, though this was not so marked as in the corresponding wheat plots. Also the 1 ton of lime on plot 5aa, and the second application of 2 tons of lime to plot 2bb, both showed up distinctly, though in the case of the wheat this had not been so. These observations, coupled with the harvest returns which confirmed them, point to much that requires studying with regard to the differences between wheat and barley as crops, and in reference to their requirements, as also to the physical and chemical effects of lime when put on the land. It would appear as if the sterile condition of, and acidity produced in, the barley soil by the continuous use of ammonia salts (as instanced in plot 2a, now practically bare) was more marked with the barley crop than the wheat, or that the barley crop, being a surface feeder, suffered more from the acid top soil. Hence a larger quantity of lime than the 5 cwt. employed on plot 2aa was probably required to neutralise the acidity and to restore fertility; whereas with the wheat crop, which goes down deeper, the lesser quantity of lime might suffice. This seems to be further borne out by the fact that 1 ton of lime on plot 5aa, and 2 tons applied a second time on plot 5bb, effected marked improvements with the barley crop, though they had been ineffective with the wheat.

The barleys ripened but slowly, and a good deal of "smut" appeared on the ears, though this was not more marked on some plots than others. The plots were harvested August 23-24, threshed on November 16, and the corn was valued.

The crop was a distinctly heavy one, and, taken all round, one of the biggest that has been obtained on this land. Though the unmanured produce, 15 bushels per acre, and that from minerals only, 18·8 bushels, were below the averages of the first twenty years (21 bushels and 22·5 bushels respectively), the farmyard manure (11b) and rape cake (10b) plots both exceeded 45·5 bushels, against averages for previous years of 39·9 and 37·4 bushels; nitrate of soda and minerals gave (plot 6) 47·5 bushels against a previous average of 43·5 bushels, while ammonia salts with minerals, including lime, reached 44·3 bushels (previous average 39 bushels). Even nitrate of

soda alone (plot 3) gave 36·3, the average being 35·6, and, used in heavy dressing with minerals (plot 9b), it gave the exceptionally heavy crop of 60·8 bushels of corn with 42 cwt. of straw, the general average for twenty years being only 49·3 bushels. It cannot, therefore, be held, as yet, that in the case of the barley crop the continuous use of nitrate of soda has been detrimental. Both farmyard manure and rape cake gave excellent crops, and the failure of the former noted in the case of the wheat this season was not repeated.

The favourable season, though it gave unusually good crops on plots 10a and 11a (residue of organic manures), did not succeed in allaying the injury done to the land by the continued use of ammonia salts without lime, for plot 2a (ammonia salts only) was nearly a blank, and plots 5a, 8a, and 8b (ammonia salts and minerals without lime) were nearly as bad. Wherever, on the contrary, lime had been put, the crop, as already observed, derived great benefit. The 5 cwt. of lime on plot 2aa gave 11·6 bushels, the 1 ton on plot 5aa 33·9 bushels, the 2 tons (applied last in 1897 to plots 2b and 5b) 25·4 bushels and 44·3 bushels respectively, while the further use of 2 tons in 1905 to the previously limed plot (2bb) resulted in a further increase of 13 bushels, though no minerals (as in 5b) had been put on. The results from plots 8aa and 8bb (lime last applied in 1897) would seem to indicate that the lime on these plots was getting used up. Table II., page 285, contains the full harvest returns.

The inferiority of quality under the influence of the use of nitrate of soda was not so marked as in most years; rather more tail corn was obtained generally, but the weight per bushel suffered but little. The best weights per bushel were obtained from the farmyard manure plot (11b) and the ammonia salts plots (5aa, 5b, 8bb) with minerals including lime.

Only three of the samples were fit for more than brown malt, these being the ones manured with ammonia salts or nitrate of soda, in each case with minerals (9a, 8aa, and 5b). As a class the barleys were below the average of the district.

Rotation Experiments (*Stackyard Field*).

As mentioned in the Report for 1904, the new rotation scheme was begun that year on the upper (or road side) half of the area, the lower half continuing to be cropped alike all over.

On the upper half (8 acres) kohl rabi was grown in 1904 and fed off, at the rate of 12 tons per acre, by sheep. On Rotations I., II., and III. the sheep had only the roots with a little clover hay chaff, but on Rotation IV. they had, on plot 1, decorticated cotton cake, on plot 2, maize meal, and on plots 3 and 4, the roots only, with, in each case, clover hay as before.

In 1905 swedes followed on Rotation I., a green crop (mustard) on Rotation II., wheat on Rotation III., and barley on Rotation IV. On the lower half of the field (8 acres) wheat was the crop all over.

The course of rotation will accordingly be :—

	Rotation I.	Rotation II.	Rotation III.	Rotation IV.
1904.	Roots	Roots	Roots	Roots (with cake and corn)
1905.	Swedes (with cake and corn)	Green crop	Wheat	Barley
1906.	Barley	Wheat	Roots (with cake and corn)	Green crop
1907.	Green crop	Roots (with cake and corn)	Barley	Wheat
1908.	Wheat	Barley	Green crop	Roots (with cake and corn)
1909.	Roots (with cake and corn)	Green crop	Wheat	Barley
1910.	Barley	Wheat	Roots (with cake and corn)	Green crop

Rotation I. 1905, *Swedes.* 1906, *Barley.*

The kohl rabi crop of 1904 was weighed out to the 150 sheep that were used to feed it off, so that the same weight (12 tons to the acre) was consumed, together with clover hay chaff, on each of the four plots of the rotation. The sheep were on the plots from November 5 to December 2, 1904. The land was then ploughed, cultivated the following spring, ploughed again May 5-12, 1905, and on June 14 "Monarch" swede seed, at the rate of 4 lb. per acre, was drilled, together with 4 cwt. to the acre of basic superphosphate and 1 cwt. per acre of sulphate of potash. Basic superphosphate was used in preference to ordinary mineral superphosphate because of the lime in it and the known poverty of the soil in lime. Despite this, "finger-and-toe" attacked the plant to a considerable extent, though, on the whole, a quite useful crop of swedes was obtained. This was pulled on November 14 and weighed November 22-27. The weights are given in Table III., below. As the crop was not influenced by the consumption of cake or corn on the land, discussion of the results is not called for here.

TABLE III.—*Rotation I. Swedes*, 1905.

Stackyard Field.

Plot	Produce per acre.			
	T.	c.	q.	lb.
1	17	5	1	8
2	20	4	3	10
3	21	15	1	22
4	19	4	2	18

Sheep were put on to eat off the swedes on each of the four plots, the quantity consumed being kept down to 12 tons per acre, together with a little clover hay chaff; the remainder of the roots were carted to the homestead. This rotation now coming into regular order (in 1906), the plan as arranged was commenced, the object being to ascertain the residual or unexhausted manure value of, on the one hand, a highly nitrogenous food like decorticated cotton cake, and, on the other hand, a starchy and low-nitrogen food like maize.

The question at issue was whether, after giving these foods to sheep feeding off a root crop on the land, the manurial values, or the differences between them, of the two foods, as set out in Lawes and Gilbert's Tables (or subsequent modifications of them), were justified in the crops subsequently grown as the result of the feeding of the cake or corn on the land. If compensation is to be paid, on the basis of the Tables, for the cake or corn so used, but the crop-producing (or unexhausted manurial) value of which has not yet been realised, it should clearly bear some relation to the increased crops which are capable of being grown thereby. It was, therefore, to see whether the crops so grown in an ordinary rotation course bore out, by their larger return, the money values assigned in the Tables, that this experiment in its new form was instituted.

It is necessary here to go back shortly to the earlier history of these rotation experiments, for the same question presented itself at their first inception in 1876. After a number of years of experimenting under the four-course rotation of roots, barley, clover, wheat, it was ascertained that the influence of the clover crop (and this crop could, it was found, be grown on the Woburn land every fourth year without difficulty) was so great on the wheat and subsequent crops as to neutralise altogether any differences between the manurial value of the highly nitrogenous decorticated cotton cake and that of the low-nitrogen maize meal. It seldom happens, however, in practice that one can take a clover crop once in four years on the same land; and, accordingly, it was now decided that if the question of manurial value were to be brought out, it must be by a course of cropping in which a clover or other leguminous crop was omitted, for the leguminous crops of the farm, it is now known (through the researches of Hellriegel), utilise the nitrogen of the atmosphere and store up nitrogen in the soil, thus practically supplying a nitrogenous manuring sufficient to neutralise the difference of effects capable of being produced by the use of such foods as decorticated cotton cake and maize meal when brought into comparison. Accordingly, in the new scheme now determined upon, it was resolved to omit the leguminous (clover) crop altogether,

and, in place of it, to grow a green crop such as mustard. In other respects the former lines were adhered to, except that cake and corn were not given in such quantity as formerly (to avoid over-manuring), and were only fed once in the course of the rotation and not twice as before. In this way it was hoped that the real differences of manurial value between decorticated cotton cake and maize meal would be brought out.

To return to Rotation I. On plot 1 the sheep were to have decorticated cotton cake given them, on plot 2 maize meal, while neither cake nor corn was to be given on plots 3 and 4, these being kept as "control" or "standard" plots. The actual quantities consumed per acre, with the 12 tons of roots and $1\frac{1}{2}$ cwt. of clover hay chaff, were 920 lb. decorticated cotton cake on plot 1 and 920 lb. of maize meal on plot 2. This came to, on the average, $\frac{1}{2}$ lb. of cake or corn per head daily throughout the period of feeding (which would be an ordinary amount for a farmer to give) together with $\frac{1}{10}$ lb. of clover hay chaff. The sheep, 100 in number, fed off first the control plots (4 and 3) and then passed on to plot 2, and finally to plot 1. The whole period of feeding off the four plots ($\frac{1}{2}$ acre each) was 33 days (November 30, 1905, to January 1, 1906). The land was then ploughed and cultivated, and "Chevalier" barley was drilled in on April 5, 1906, at the rate of 9 pecks per acre. The crop came very well, and it was soon noticeable that plot 1 (decorticated cotton cake) was much superior to the others, between which, however, there was little to choose. Heavy rains towards the end of June damaged the barley a good deal, and plot 1 went down in places somewhat, though it recovered later. The plots were harvested August 23-24, threshed on November 16, and subsequently valued. The results are given in Table IV.

TABLE IV.—*Rotation I. Barley*, 1906.

Stackyard Field—Produce per acre.

Plot		Head corn			Tail corn	Straw, chaff, &c.	Value of corn per quarter on basis of 27*s*.
		Weight	Bush.	Weight per bushel	Weight		
		C. q. lb.		Lb.	Lb.	C. q. lb.	*s*. *d*.
1	Swedes fed off with dec. cotton cake .	26 3 3	55·4	54·1	30	35 1 10	25 0
2	Swedes fed off with maize meal . .	23 1 3	47·4	55·0	21	28 0 17	26 0
3	Swedes fed off without cake or corn .	23 0 27	47·0	55·3	34	25 3 26	27 6
4	Swedes fed off without cake or corn .	22 1 10	45·1	55·5	26	24 1 4	26 0

It will be noticed that the weighings bore out the appearances that the growing crops had presented. Plot 1 (decorticated cotton cake) produced 8 bushels more barley and 7 cwt. more straw than did plot 2 (maize meal), the latter being practically the same, as regards corn, as plot 3, but yielding 2 cwt. more straw. The duplicate plots (3 and 4) differed by nearly 2 bushels of corn, and might well have been closer. Probably an average of the two would be the fairest reckoning, and this would give :—

Plot	Increase per acre over unmanured produce		
	Corn		Straw
	Weight	Bushels	
	C. q. lb.		C. q. lb.
1 (decorticated cotton cake fed) . .	3 3 26	9·35	10 0 23
2 (maize meal fed)	0 1 26	1·35	3 0 2

The corn from plot 1 was hardly of as good quality as the other lots, not being so well matured.

Rotation II. 1905, *Green Crop* (*Mustard*). 1906, *Wheat.*

The kohl rabi of 1904—12 tons per acre—was fed off by 150 sheep without cake or corn, from December 3 to December 27, 1904, after which the land was ploughed and cultivated through the spring of 1905. Mustard was drilled in on July 6, and the crop was ready for cutting on August 18. It was ploughed in as green stuff on September 2-4, and then wheat, "Square Head's Master," was drilled in on October 6, 1905, at the rate of 9 pecks per acre. The crop was quite a fair one, and was ready for cutting on August 9, 1906. It was carted on August 17, threshed on November 15, and afterwards valued. The returns are given in Table V.

TABLE V.—*Rotation II. Wheat*, 1906.

Stackyard Field—Produce per acre.

Plot	Head corn			Tail corn	Straw, chaff, &c.	Value of corn per quarter on basis of 27*s.* 6*d.*
	Weight	Bush.	Weight per bushel	Weight		
	C. q. lb.		Lb.	Lb.	C. q lb.	*s.* *d.*
1	20 0 4	36·7	61·2	42	27 3 10	27 0
2	19 2 17	35·8	61·5	48	27 2 22	27 0
3	14 3 22	26·9	62·3	34	21 1 9	27 0
4	14 3 27	26·6	63·0	49	21 3 8	27 0

The results show that the yields of plots 1 and 2 were closely alike, and also those of plots 3 and 4 ; but between the two sets there was a difference of about 9 bushels of corn and 6 cwt. of straw, for which there is no apparent reason, all four plots having been treated alike, and no decorticated cotton cake or maize meal having been fed as yet to plots 1 and 2. The samples were all of even quality.

Rotation III. 1905, *Wheat.* 1906, *Swedes.*

The kohl rabi was, as in the case of the other rotations, fed off between December 27, 1904, and January 16, 1905. The land was then ploughed and cultivated, and on February 27, red "Nursery" wheat was drilled at the rate of 9 pecks per acre. The wheat came very well and produced a nice crop, which was ready for cutting on August 25. It was carted on September 1, and threshed and weighed on November 3. The produce is given in Table VI.

TABLE VI.—*Rotation III. Wheat*, 1905.

Stackyard Field—Produce per acre.

Plot	Head corn			Tail corn	Straw, chaff, &c.	Value of corn per quarter on basis of 29*s*.
	Weight	Bushels	Weight per bushel	Weight		
	C. q. lb.		Lb.	Lb.	C. q. lb.	*s*. *d*.
1	19 1 16	35·1	61·8	112	31 0 21	29 6
2	19 3 25	36·0	62·1	99	31 0 3	29 0
3	20 2 26	37·6	61·7	85	32 1 15	29 0
4	21 2 8	39·0	61·9	89	35 0 26	30 0

The four lots were considered excellent samples of spring sown wheat. Plot 4 was the best quality, and was valued at 30*s*. per quarter on a basis of 29*s*. for the season. Plot 1 was put at 29*s*. 6*d*., and plots 2 and 3 at 29*s*.

In this case, plots 3 and 4 gave a somewhat higher yield than did plots 1 and 2, but, as the wheat did not follow the consumption of decorticated cotton cake or maize meal on any of the plots, it is unnecessary to pursue the figures further here. Swedes followed as the crop in 1906.

The wheat stubble was cleaned and ploughed in the autumn of 1905, ploughed again in May, 1906, and cultivated. On May 25, 4 cwt. per acre of basic superphosphate and 1 cwt. per acre of sulphate of potash were applied to the land, and "Monarch" swede seed was drilled on May 28. Owing to dry weather early in June, the plant was badly attacked by "fly," and fresh seed was drilled in to fill up the gaps.

This was fairly successful, and, after considerable difficulty, a moderate crop of swedes was obtained. The roots were set out July 4-7, and again singled July 13-20. "Finger-and-toe" showed itself to a considerable extent, and the crop required a great deal of attention. Ultimately it did rather better than seemed at one time likely, and the roots were finally pulled and weighed December 6-10. The results are given in Table VII.

TABLE VII.—*Rotation III. Swedes*, 1906.

Stackyard Field.

Plot	Produce per acre.			
	T.	c.	q.	lb.
1	8	1	1	0
2	8	0	2	14
3	9	5	0	0
4	10	10	0	0

The produce coming below the 12 tons per acre required, the balance to be fed off by sheep was made up with swedes grown on the headlands, and the sheep were put on the plots on December 14, 1906, to feed them off with, on plot 1, decorticated cotton cake, on plot 2, maize meal, and on plots 3 and 4, the roots alone.

Rotation IV. 1905, *Barley.* 1906, *Green crop* (*Mustard*).

This rotation was the first one in which any direct results of the manuring with decorticated cotton cake or maize meal respectively could be looked for, as the kohl rabi crop of 1904 was fed off with decorticated cotton cake on plot 1, maize meal on plot 2, and neither cake nor corn on plots 3 and 4. The subsequent barley crop of 1905, accordingly, was the direct product of the manuring adopted.

The quantities of cake and corn were the same as given under Rotation I. in 1905, viz., 920 lb. per acre, with 12 tons of roots and 1½ cwt. of clover hay chaff. The sheep (150) took from January 16, 1905, to February 3, 1906, to do this. The land was ploughed at once and "Hallett's Chevalier" barley drilled at the rate of 9 pecks per acre on March 8. It was soon seen that plots 1 and 2 were considerably heavier than plots 3 and 4, and, of the two, plot 1 was apparently the bigger. The barley came into ear by June 19, but the heavy rains about this time laid the crop very considerably on plot 1. This interfered with its ripening properly, and though, had it "stood up," it would have been by far the heaviest crop of the four plots, it was prevented from

showing, in the actual returns, the full advantage that decorticated cotton cake would otherwise have given. The barley was cut on August 26, carted on September 4, after having to be "opened out" again in order to dry it. The produce was threshed on November 2, and the results are given in Table VIII.

TABLE VIII.—*Rotation IV. Barley*, 1905.

Stackyard Field—Produce per acre.

Plot		Head corn			Tail corn	Straw, Chaff, &c.	Value of corn per quarter on basis of 28*s*.
		Weight	Bush.	Weight per bushel	Weight		
		C. q. lb.		Lb.	Lb.	C. q. lb.	*s*. *d*.
1	Kohl rabi fed off with dec. cotton cake .	22 2 11	47·4	53·3	146	31 1 23	24 6
2	Kohl rabi fed off with maize meal . .	18 2 21	39·0	53·6	110	24 1 5	25 6
3	Kohl rabi fed off without cake or corn .	20 1 25	42·7	53·7	150	29 0 10	26 0
4	Kohl rabi fed off without cake or corn .	18 3 15	39·3	53·7	183	24 2 24	26 0

It will be seen that plot 1 (decorticated cotton cake) gave the highest yield, though, as explained, this would have been much higher but for the damage that the barley received from the storms near harvest time. The produce of plot 2 (maize meal), on the contrary, was rather less than that of the unmanured plots. The differences are shown thus :—

Plot	Increase or decrease per acre over unmanured produce		
	Corn		Straw
	Weight	Bushels	
	C. q. lb.		C. q. lb.
1 (decorticated cotton cake fed) . .	+2 3 19	+6·4	+4 2 6
2 (maize meal fed)	−0 3 27	−0·2	−2 2 12

The quality of the barley of plot 1 was, as was to be expected, inferior to that of the other plots ; it was valued at 24*s*. 6*d*. per quarter on a basis of 28*s*. for the season, the other plots being put at 25*s*. 6*d*. and 26*s*. All the barley was more or less spoilt by the weather. The land was ploughed after the barley crop, cultivated through the spring of 1906, and, on March 26-28, 2 tons per acre of lime were spread on it. On June 14, white mustard seed was drilled in, and gave a good plant. The mustard crop was cut, carried, and weighed green

on July 27. The results are given in Table IX. below. A second lot of mustard was drilled in on August 11, but the drought caused it to fail altogether, and it was ploughed up, the land being then left for wheat to form the crop of 1907.

TABLE IX.—*Rotation IV. Mustard*, 1906.

Stackyard Field.

Plot	Green produce per acre.	T.	c.	q.	lb.
1	After barley—decorticated cotton cake plot .	3	5	0	0
2	,, ,, maize meal plot . . .	3	17	3	0
3	,, ,, no cake or corn . . .	3	4	1	4
4	,, ,, ,, ,, . . .	2	14	1	0

GREEN-MANURING EXPERIMENT (*LANSOME FIELD*), 1905 and 1906.

Barley having been grown in 1904, the land came in for green crops in 1905, to be followed by wheat in 1906. The green crops were, as before, mustard, rape, and tares, but it was decided to try winter-sown, instead of spring-sown, tares, so that the latter crop, being longer on the land, might have more time in which to store up nitrogen, and also prevent to some extent loss by drainage through the winter. In this way, it was thought, the tares would have a better chance of showing their superiority as a preparation for a corn crop, if such superiority really existed. It will be remembered that, up to the present time, tares—though a highly nitrogenous crop—have, over a number of years, failed to give as good a succeeding corn crop as has mustard. On the upper half (plots 1, 3, and 5), mineral manures (superphosphate 3 cwt. and kainit 2 cwt. per acre) were applied again, and on the lower half (plots 2, 4, and 6), 1 ton of lime per acre was now put, to ensure that there should be no failure due to lack of lime. The latter was applied on October 31, 1904, and the mineral manures were applied to plot 1 on November 16, 1904.

Winter tares were drilled on November 2, 1904, on plots 1 and 2, and they came up very well. Rape seed (5 lb. per acre) was drilled on plots 3 and 4, and white mustard seed on plots 5 and 6, on May 11, 1905. Mineral manures went on plots 3 and 5 on May 13. The rape did not grow well and never was a strong crop, but the mustard flourished. The crops generally seemed to be better on the half with mineral manures applied. The tares began to flower June 22, and on July 3 the crops, both of mustard and tares, were cut, weighed green, and then returned to the land and ploughed in. The weights of green produce are given in Table X., page 300.

TABLE X.—*Green-manuring Experiment* (*Lansome Field*), 1905.

Plot	Crop	Manure	Green produce per acre			
			T.	c.	q.	lb.
1	Tares . . .	Mineral manures .	7	2	2	0
5	Mustard . . .	,, ,, .	5	10	1	0
2	Tares . . .	Lime . . .	6	14	1	0
6	Mustard . . .	,, . . .	5	5	0	0

It will be seen that the tares in each case gave the greater amount of green stuff. It was considered well to make analyses of the tares and mustard as ploughed in. From these the following figures may be taken :—

	Tares (green) per cent.	Mustard (green) per cent.
Moisture	73·46	72·16
Organic matter	24·45	25·53
Nitrogen	1·05	0·46

Hence the turning in of the green crops added more than twice as much nitrogen in the case of the tares as in that of the mustard. Nevertheless, as will be seen later, this, as in former years, failed to produce as good a corn crop as did the mustard. The rape was too small a crop to cut separately, and so was turned in direct. Second sowings of tares, rape, and mustard were made on July 27, and were ploughed in on September 16 (rape and mustard) and September 27 (tares). "Square Head's Master" wheat was drilled in, at the rate of 9 pecks per acre, on October 13, 1905, and came up well. Up to April 21, 1906, the wheat after tares looked rather the best (this has been noted in former years also), but by June a change had come and the wheat after rape was the best, then that after mustard, the tares lot being undoubtedly inferior to the others. The crop was cut on August 7, carted on August 16, threshed and weighed on November 14. The results are given in Table XI., page 301.

The corn, when valued, was practically of equal quality throughout.

The highest produce was, once more, obtained from green-manuring with mustard, plot 5 (with mineral manures) giving the best return ; the rape plots were but little inferior, and mustard and rape each gave, on the average, 10 bushels more corn than did the tares, in spite of the extra manuring with nitrogen which the latter crop supplied. This result affords a thorough confirmation of the results obtained in former years, and leaves for solution a very interesting question, viz., What is the cause of the apparent disappearance, or, at least,

the non-working, of the nitrogen, whereby a result is obtained in practice which is so different from that which theoretical considerations would lead one to expect?

TABLE XI.—*Green-manuring Experiment* (*Lansome Field*).

Produce of Wheat per acre, 1906.

Plot	Manuring	Head corn			Tail corn	Straw, chaff, &c.
		Weight	Bush.	Weight per bushel	Weight	
		Lb.		Lb.	Lb.	T. c. q. lb.
1	Tares ploughed in, with mineral manures . .	1,540	24·5	62·7	63	0 17 1 24
2	Tares ploughed in, with lime	1,592	25·7	61·8	48	0 17 3 14
3	Rape ploughed in, with mineral manures . .	2,076	33·6	61·7	66	1 5 2 7
4	Rape ploughed in, with lime	2,216	35·8	61·8	60	1 6 3 20
5	Mustard ploughed in, with mineral manures . .	2,357	37·6	62·6	66	1 8 0 15
6	Mustard ploughed in, with lime	2,132	34·1	62·6	63	1 4 2 8

"HEAD" AND "TAIL" BARLEY (*LANSOME FIELD*), 1905.

This was a repetition of earlier experiments on this subject. It might be more accurate to describe the corn sown as "large" and "small" grains, inasmuch as it was not the whole "tail" corn as screened out that was sown, but in the one case the larger and plumper grains, and in the other the smaller grains that were used. Both lots were taken from the same crop. Three plots were selected on Lansome Field; on one of them the larger grains or "head" corn were sown at the rate of 8 pecks per acre, on a second plot the same quantity (8 pecks) of small corn, and on a third the small corn at the rate of 12 pecks per acre, the weight of corn sown in this case being the same as that of the 8 pecks of "head" corn. The barley followed white turnips fed off with cake and was drilled on April 18, 1905, 3 cwt. per acre of superphosphate being given on April 22. At the end of May the "tail" barley looked just as well as the "head." The appearances of the plots caused much interest to visitors to the farm and opinions were much divided as to which plot would turn out best. The plots were cut on September 1, carted on September 4, threshed and weighed on February 1, 1906. The results are given in Table XII., page 302.

TABLE XII.—"*Head*" *and* "*Tail*" *Barley* (*Lansome Field*), 1905.

Produce per acre.

Plot		Head corn			Tail corn		Straw, chaff, &c.
		Weight	Bush.	Weight per bushel	Weight	Bush.	
		Lb.		Lb.	Lb.		C. q. lb.
1	"Tail" corn, 12 pecks per acre . . .	2,063	39·7	52·0	167	5·2	24 0 26
2	"Tail" corn, 8 pecks per acre . . .	1,904	36·4	52·4	152	3·5	21 0 18
3	"Head" corn, 8 pecks per acre . . .	1,661	32·1	51·9	145	3·6	19 3 17

The thickly sown "tail" corn gave 3 bushels more corn and 3 cwt. more straw than did the "tail" corn less thickly sown, while the latter produced 4 bushels more barley and 2 cwt. more straw than did the "head" corn. Moreover the weight per bushel with the "tail" seed was in no way inferior to that from "head" corn. The barley of plots 1 and 3 was valued at 26*s.* 6*d.* per quarter, and of plot 2 at 27*s.* It would seem from this and earlier experiments to be by no means the case that the selection of large plump grains, or the rejection of the smaller corn, is advisable for seed purposes.

CANADIAN WHEAT ("*RED FIFE*"), 1905 (*GREAT HILL*) *and* 1906 (*LANSOME FIELD*).

Canadian wheat has for some years past been tried at the Woburn Farm. Of different varieties experimented with, the "Red Fife" has proved the best. The seed now used had been grown on the farm, and this was the fourth year of its growing in England. In comparison with it was put, in the same field, English wheat ("Square Head's Master"), both lots following clover. The English wheat was drilled (9 pecks per acre) on October 25-26, 1904. It looked rather poor during the winter, and on March 2-3, 1905, was given a top-dressing of 40 bushels of soot per acre. The Canadian wheat ("Red Fife") was drilled on February 14, 1905, at the same rate (9 pecks per acre) and had a similar dressing of soot in March. It came well and in June looked quite as forward as the English wheat. The two crops came into bloom on the same day (June 22). The "Red Fife" was cut on August 7, and carted August 22, the English wheat being cut on August 8-9. Both crops were threshed November 1. The respective weights are given in Table XIII., page 303.

TABLE XIII.—*Canadian and English Wheat*, 1905 (*Great Hill*), 1906 (*Lansome Field*).

Produce per acre.

	Variety	1905						
		Headcorn			Tail corn		Straw, chaff, &c.	Value of corn per quarter on basis of 29*s.*
		Weight	Bush.	Wght. per bush.	Weight	Bush.		
		Lb.		Lb.	Lb.		C. q. lb.	*s.* *d.*
Autumn sown	English ("Square Head's Master").	1.826	29·5	61·8	8	0·18	25 2 8	29 6
Spring sown	Canadian ("Red Fife")	1.628	26·3	61·8	61	1·05	21 2 0	29 6
		1906						
Autumn sown	English ("Square Head's Master").	2.101	33·8	62·1	46	0·9	24 2 21	Basis 27*s.* 6*d.* 27 0
Autumn sown	Canadian ("Red Fife")	1.286	20·2	63·6	42	0·8	17 3 25	28 6

In 1906 the experiment was repeated on a different field (Lansome Field), the English wheat being "Square Head's Master," as before, but the Canadian, though it was "Red Fife," was obtained from a grower at Faversham, Kent. Further, the Canadian wheat, instead of being spring-sown, was this time sown in autumn. The English wheat was drilled (9 pecks per acre) on October 13, 1905, and received in May, 1906, a top-dressing of 6 cwt. per acre of soot. The Canadian wheat was drilled on November 7, 1905, and had in May a similar dressing of soot. The English wheat came into bloom on June 26, the Canadian on June 25. The "Red Fife" throughout looked much the thinner crop, and was not at all equal to what had been grown on the farm before. Both lots were fit to cut on August 7, and were carted on August 16, being threshed and weighed on November 14. The weights are given in Table XIII., above.

In each case the English wheat gave the higher yield of corn and the more straw. In 1905 the increase was 3·2 bushels of corn with 4 cwt. of straw; in 1906 it was no less than 13·6 bushels of corn and 7 cwt. of straw. In the latter year the Canadian wheat was manifestly inferior to what had been grown before, and it is open to question whether the four years of its previous growing in England may not have deprived it of its characteristics. In 1905 the weight per bushel was the same, though the English wheat had less "tail" corn. In 1906 the Canadian wheat weighed rather the heavier.

In respect of quality, in 1905 the "Red Fife" was stated to be the finest sample of wheat grown on the farm, being

a very even, though small, grain, with much strength ; the English wheat had, however, been rather better harvested, and was priced at the same figure (29*s.* 6*d.* per quarter). But it should be mentioned that when first threshed out and offered as seed, the English wheat was priced at 30*s.* per quarter, and the Canadian at 35*s.*

In 1906 the English wheat was priced at 27*s.*, and the Canadian at 28*s.* 6*d.* per quarter, the English being considered a good average sample, but distinctly inferior, both in colour and strength, to the Canadian. The much higher produce of the English wheat, whether the Canadian be spring or autumn sown, makes it clearly, however, the more remunerative ; and it would seem that in the spring-sowing of Canadian wheat there is the most likelihood of its successful use, especially when, from land not being in good condition for autumn sowing, it is difficult to get wheat in early.

Soot as a Top-Dressing for Wheat (*Great Hill*) 1905.

In the county of Bedford soot is extensively used and is a favourite dressing for wheat, more particularly on the heavier lands. At the same time soot is a very variable article, and not infrequently is adulterated. It was thought well to make an experiment with it at the Woburn Farm, and to see, especially, whether the large quantities commonly employed are justified, or whether, if good soot be obtainable, smaller amounts will not do as well.

The soot used cost 50*s.* per ton and gave on analysis :—

	Per cent.
Nitrogen	4·56
Equal to ammonia	5·53

The soot was used at two different rates, viz., 40 bushels per acre, and 20 bushels per acre. The soot weighed 28 lb. per bushel, so that the dressing of 20 bushels came to 5 cwt. per acre, costing 12*s.*6*d.*, the 40 bushels costing 25*s.* In order to get an idea whether any value attached to the soot beyond that of its containing a certain amount of nitrogen, a comparative test was made with a plot on which 1½ cwt. to the acre of nitrate of soda was used, this quantity containing an amount of nitrogen equal to that in 20 bushels of the soot. The cost of this was 17*s.* 3*d.*

"Square Head's Master" wheat was drilled (9 pecks per acre) on October 25-26, 1904, and the soot was applied on March 3, 1905. The nitrate of soda was put on in two dressings, the first on March 23, and the second on May 13. All the dressed plots soon began to look better than the unmanured one, but between them there was no great difference noticeable; the heavier dressing of soot (plot 1)

looked rather the best. The wheat crop was cut on August 9, carted August 21, and threshed November 1. The results are given in Table XIV.

TABLE XIV.—*Soot as Top-dressing for Wheat (Great Hill)*, 1905.

Produce per acre.

Plot	Manuring per acre	Head corn			Tail corn		Straw, chaff, &c.	Value of corn per quarter on basis of 29*s*.
		Wght.	Bush.	Wght. per bush.	Wght.	Bush.		
		Lb.		Lb.	Lb.		C. q. lb.	*s.* *d.*
1	Soot—40 bushels	2,721	42·1	64·6	346	5·7	27 2 10	29 0
2	„ 20 „	2,286	35·1	65·0	271	4·5	23 3 5	30 0
3	Unmanured	1,828	28·2	64·7	298	4·9	19 3 11	30 0
4	Nitrate of soda—1½ cwt. . .	2,220	34·5	64·3	366	6·1	24 3 27	30 0

The wheats were described as being equal to any seen in the district that season. The manured plots, it will be noticed, were all well ahead of the unmanured; between 1½ cwt. of nitrate of soda (plot 4) and 20 bushels of soot (plot 2) there was nothing to choose, but the heavier dressing of soot gave a further increase of 7 bushels of corn to the acre with nearly 4 cwt. more straw. From this it will be seen that the 20 bushels of soot gave as good a return, at lower cost, as the nitrate of soda, while the extra expenditure of 12*s*. 6*d*. in increasing the dressing of soot to 40 bushels was more than justified by the increased produce. It would further appear that, beyond its actual nitrogen contents, there is an advantage in the soot, due either to the organic matter in it, or, possibly, to the mechanical effect which it exercises on the land.

POTASH MANURING FOR POTATOES (*ROAD PIECE FIELD*), 1905.

In 1904 an experiment was conducted on the use of sulphate of potash and kainit respectively for the potato crop, together with a comparison of the relative effects of nitrate of soda and sulphate of ammonia used with the potash salts. The result was, generally, to point to sulphate of potash being the preferable form of potash manuring, and to sulphate of ammonia being rather better than nitrate of soda. This experiment was repeated on exactly similar lines in 1905. Farmyard manure was spread in the rows, at the rate of 12 tons per acre, April 15-21, 1905; and the potatoes (variety "Up-to-date) were set April 24-25, the artificial manures being given at the same date. The potatoes were dug up on October 2, and the results of weighing are recorded in Table XV., page 306.

TABLE XV.—*Potato Experiments* (*Road Piece Field*), 1905.

Plot	Manures per acre	Produce of tubers per acre		
		Ware	Seed	Total
		T. c. q. lb.	T. c. q. lb.	T. c. q. lb.
1	Superphosphate, 3 cwt.; nitrate of soda, 1 cwt.; sulphate of potash, 1 cwt.	4 18 3 0	1 2 2 0	6 1 1 0
2	Superphosphate, 3 cwt.; nitrate of soda, 1 cwt.; kainit, 4 cwt.	4 16 1 0	0 18 3 25	5 15 0 25
3	Superphosphate, 3 cwt.; sulphate of ammonia, 1 cwt.; kainit, 4 cwt.	4 14 2 21	0 18 3 0	5 13 1 21
4	Superphosphate, 3 cwt.; sulphate of ammonia, 1 cwt.; sulphate of potash, 1 cwt.	5 9 2 1	0 17 2 0	6 7 0 1

These results supply a direct confirmation of those of 1904, the plots now occupying exactly the same relative positions in order of merit as they did then. Sulphate of potash has again proved better than kainit, whether used with sulphate of ammonia or with nitrate of soda; and 1 cwt. of sulphate of ammonia per acre has, on the whole, done better than 1 cwt. of nitrate of soda. In each of the years, however, the combination of nitrate of soda and kainit has proved better than that of sulphate of ammonia and kainit, though it is hard to assign any reason for this being the case. It may now fairly be concluded that, for the potato crop on light land, 1 cwt. per acre of sulphate of potash is a better dressing than 4 cwt. of kainit, the two supplying practically equal quantities of potash.

NITRATE OF SODA AND SALT FOR MANGELS (*ROAD PIECE FIELD*), 1905 AND (*WARREN FIELD*) 1906.

The extent to which nitrate of soda can be profitably used as a top-dressing for mangels is often a matter of question; so also is the use of common salt. On some heavy lands, where mangel is grown year after year, it may pay to use nitrate of soda, even up to 4 cwt. per acre, but this is not the practice of the ordinary farmer, who would confine himself, as a rule, to 1 cwt. or 1½ cwt. per acre. An experiment was devised on these lines and carried out in the two years, 1905 and 1906. Farmyard manure, at the rate of 12 tons per acre, was ploughed in early in April, and mangel seed (7 lb. per acre) drilled subsequently. The top-dressings per acre were respectively :— plot 2, nitrate of soda 1 cwt.; plot 3, nitrate of soda 1 cwt., salt 1 cwt.; plot 4, nitrate of soda 2 cwt.; while plot 1 had only the farmyard manure. The top-dressings were put on

towards the close of June. In 1905, "Yellow Globe" mangel was grown, in 1906, "Golden Tankard," and the crops were ready for pulling about the middle of October. The results for the two years are given in Table XVI.

TABLE XVI.—*Mangel Experiments*, 1905 (*Road Piece Field*), *and* 1906 (*Warren Field*).

Plot	Manures per acre	Produce of roots per acre							
		1905				1906			
		T.	c.	q.	lb.	T.	c.	q.	lb.
1	Dung only	20	19	0	0	26	9	2	21
2	Dung with nitrate of soda, 1 cwt. . .	27	9	1	0	28	7	2	7
3	Dung with nitrate of soda, 1 cwt. ; salt, 1 cwt.	28	8	0	0	28	12	2	14
4	Dung with nitrate of soda, 2 cwt. . .	24	3	3	0	27	16	0	14

The experiment of 1905 gave considerable gains from the use of top-dressings over dung alone, but also showed what seemed to be anomalous, viz., that 2 cwt. of nitrate of soda should give a less crop than 1 cwt. of nitrate of soda. For this reason the experiment was repeated in 1906, and, though lower gains were obtained from the top-dressings, the plots arranged themselves again in the same order as in 1905. That is to say, the best return was in each year obtained by using the mixture of 1 cwt. of nitrate of soda and 1 cwt. of salt, and the next best from using 1 cwt. of nitrate of soda alone, the doubling of the dressing of nitrate of soda not only producing no increase, but giving actually a smaller crop.

EXPERIMENT ON LATE PULLING OF MANGELS (*WARREN FIELD*), 1906.

It has not infrequently been asserted that it is a mistake to keep mangels long in the ground, but that it is advisable to pull them fairly early, as any subsequent growth which they may make consists mainly of water. To put this to the test a portion of the mangel crop grown in Warren Field in 1906 (see last experiment) was taken up at the usual time, October 10, while another portion was left to grow on until the first frost made its appearance. This was on November 12, or, practically, a month later than the first portion. The mangel was "Golden Tankard," and the plots were not the top-dressed ones mentioned in the last experiment, but others by the side of them, and manured per acre with dung (12 tons), superphosphate (3 cwt.), and sulphate of potash (1 cwt.). When the two lots were pulled the roots were weighed, portions carefully drawn and analysed. The results were :—

	Pulled October 10, 1906. T. c. q. lb.	Pulled November 12, 1906. T. c. q. lb.
Weight of cleaned roots per acre	18 4 1 4	24 7 2 0
Analysis:—		
Moisture	89·32	89·44
Albuminous matters	1·00	1·06
Sugar and digestible carbohydrates, woody fibre, &c.	8·83	8·55
Mineral matter (ash)	0·85	0·95
	100·00	100·00
Nitrogen	0·16	0·17

It is clear from this that not only did the crop increase very materially in weight by keeping it in the ground the extra month, but that the roots were in no way inferior at the later period; also that the increase is not due to water only. Of course one season will differ from another, and in 1906 frosts were late in making their appearance; but it may be concluded that it will be of advantage, rather than otherwise, to keep the crop in the ground until the winter frosts come.

Lucerne (*Stackyard Field*), 1905 and 1906.

On these plots, which were re-sown in 1902, the manurial treatment (which had been given in 1902, 1903, and 1904) was given again in 1905, but discontinued in 1906.

Two cuttings were obtained in 1905, and three in 1906, The results are given in Table XVII., below. Three new

Table XVII.—*Lucerne (Stackyard Field).*

Green produce per acre, 1905 and 1906 (fourth and fifth years).

Plot	Manures per acre, applied 1902, 1903, 1904-1906.	Green produce per acre[1]							
		1905				1906			
		T.	c.	q.	lb.	T.	c.	q.	lb.
1	No manure	4	3	2	10	7	8	1	6
2	Superphosphate, 4 cwt.; bone dust, 4 cwt.	2	11	0	26	5	11	3	17
3	Sulphate of potash, 4 cwt.	3	15	2	0	7	12	2	19
4	Sulphate of ammonia, 2 cwt.	3	10	0	12	5	14	2	11
5	Nitrate of soda, 2 cwt.	3	12	3	6	8	5	0	17
6	Superphosphate, 4 cwt.; bone dust, 4 cwt.; sulphate of potash, 4 cwt.; sulphate of ammonia, 2 cwt.	11	14	2	10	12	12	0	13
7	Superphosphate, 4 cwt.; bone dust, 4 cwt.; sulphate of potash, 4 cwt.; nitrate of soda, 2 cwt.	11	6	2	0	14	18	3	25

[1] Two cuttings in 1905, three in 1906.

plots were started in 1905 and manured per acre respectively as follows:—

Plot 8. No manure.
,, 9. Lime, 2 tons.
,, 10. Superphosphate, 3 cwt.; sulphate of potash, 1 cwt.

From the weights given it will be seen that plots 6 and 7 (mixed mineral manures, including potash, with nitrogenous salts) maintained the marked superiority they had shown in previous years, and were the only ones to give a really good crop.

Varieties of Lucerne (*Stackyard Field*), 1905 and 1906.

Considerable difference of opinion existing as to the relative values of different varieties of lucerne, a trial was begun in 1905 with three different sorts, kindly supplied by a member of Council. The three sorts were:—(1) Provence seed, the kind usually purchased in England, and the dearest sort; (2) American seed, the Alfalfa of South America; (3) a Canadian variety. The seed was drilled in on June 15, 1905, no manure being used. No cutting was obtained in 1905, but in 1906 three cuttings were taken, viz., on June 20, August 17, and November 6. From the beginning the Canadian variety looked the best, then the American. The weights are given in Table XVIII.

Table XVIII.—*Varieties of Lucerne (Stackyard Field).*

Plot	Green produce per acre, 1906 (first year).				
		T.	c.	q.	lb.
A	Provence seed	3	2	2	0
B	American seed	3	7	2	23
C	Canadian seed	3	19	0	7

Varieties of Clover (*Lansome Field*), 1906.

Mr. Carruthers, the Society's Consulting Botanist, having obtained parcels of clover seed from reliable sources in Canada, America, and elsewhere, it was decided to make a trial of these at the Woburn Farm, in regard to their cropping power and duration of growth. Plots were, accordingly, laid out in Lansome Field, sown with a barley crop, and the clover seed drilled in between the rows on May 11, 1905, at the rate of 21 lb. per acre. The different varieties were:—

Plot 1. Chilian red clover
,, 2. Canadian red clover.
,, 3. Canadian mammoth red clover.
,, 4. English red clover.
,, 5. English late-flowering red (or cow-grass) clover.
,, 6. Canadian red clover (old seed).
,, 7. Canadian mammoth red clover (old seed).
,, 8. Silesian red clover.

It had been intended to start this experiment in 1904, and the seed used on plots 6 and 7 was kept over from then. A very good plant of clover was obtained, and stood the

winter well. In June, 1906, the Silesian clover (plot 8) was not quite so advanced as the Canadian varieties and did not show so much flower. Plot 4 (English late-flowering) was similar to it in this respect. Plots 1 and 2 (Chilian and Canadian) looked about the best. All the plots were cut on June 22, and the produce weighed. A second cutting was obtained of all the plots on August 8, except plot 5 (English late-flowering), which was cut on August 20. The weights of produce, as clover hay, are given in Table XIX.

TABLE XIX.—*Varieties of Clover (Lansome Field).*

Plot	Variety	Clover hay per acre, 1906 (first year).											
		First cutting, June 22				Second cutting. August 8				Total			
		T.	c.	q.	lb.	C.	q.	lb.		T.	c.	q.	lb.
1	Chilian red	1	10	1	14	18	0	0		2	8	1	14
2	Canadian red	1	13	0	21	16	1	7		2	9	2	0
3	„ mammoth red	1	16	0	0	13	2	0		2	9	2	0
4	English red	1	8	0	14	21	3	21		2	10	0	7
5	„ late-flowering red (cow-grass)	2	2	3	0	4	2	0		2	7	1	0
6	Canadian red (old seed)	1	9	1	0	7	2	6		1	16	3	6
7	„ mammoth red (old seed)	1	14	1	7	9	1	8		2	3	2	15
8	Silesian red	0	16	3	14	9	1	14		1	6	1	0

From these results it will be seen that, while the English late-flowering red gave the largest first cut, the second cutting was very small, and the highest total produce was obtained in the year from the English red, though this was not appreciably in advance of either the Chilian or the two Canadian varieties. The Silesian clover gave much the lowest produce of all. The largest second cut was got from the English red. The plots will be left down for another year.

RAINFALL AT WOBURN EXPERIMENTAL STATION, 1905 AND 1906.

(292 ft. above sea level.)

	1905 In.	1906 In.		1905 In.	1906 In.
January	0·61	3·06	July	0·94	0·60
February	0·72	1·69	August	2·64	1·17
March	2·47	1·67	September	1·73	1·25
April	1·83	0·65	October	1·11	3·85
May	0·72	1·61	November	2·11	4·38
June	3·62	3·48	December	0·81	1·82
			Total	19·31	25·23

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STATISTICS AFFECTING BRITISH AGRICULTURAL INTERESTS.

THE tables printed on pp. 318-331 are compiled from the official publications of the Board of Agriculture and Fisheries, including the Agricultural Statistics for 1905 [Cd. 3061]; the Agricultural Statistics for 1906, Vol. XLI., Part I. (Acreage and Live Stock Returns) [Cd. 3281]; the preliminary statements as to produce of crops and yield per acre for 1906; Vol. I. of the Annual Statement of the Board of Trade; and the Trade and Navigation Accounts for December, 1906. On this occasion, the tables have been brought up to date, wherever possible, by the inclusion of the figures for 1906; and in certain cases changes have been made in consequence of revisions effected by the Board of Agriculture. Where not otherwise stated, the tables are compiled from the Agricultural Statistics.

YIELD AND ACREAGE OF CROPS IN GREAT BRITAIN.

The following observations are reproduced from the Agricultural Returns of 1905 and the Acreage and Live Stock Returns of 1906:—

ESTIMATED YIELD OF CROPS IN 1905.

Wheat.—Wheat is in most places generally regarded as the crop of the year, the relatively dry season having suited it. The total production amounted to 58,902,499 bushels, or over 22,000,000 bushels more than in 1904 and larger than in any previous year since 1899. The yield per acre (32·78 bushels) is nearly 2¼ bushels above the mean of the previous ten years, and 6 bushels above the poor return of 1904. In England only two counties (apart from London and Westmorland, which grow but infinitesimal quantities of wheat) showed a deficiency from the mean: these were Huntingdon and Kent; while 5 bushels or more above the average were secured in Rutland, Dorset, Derby, and Durham. The crop in Scotland was 4¾ bushels above the average; the chief wheat-growing county, Fife, having 8·3 bushels above the mean.

Barley.—The total production of barley showed an increase, but one of scarcely 1,000,000 bushels over the total of 1904. The yield per acre was more than a bushel above the average; the Scottish excess over the mean being double that of England, while Wales had two-thirds of a bushel above the average. Ten counties in England failed to reach the average; Shropshire and the East Riding of York fell short by a couple of bushels or more. Rutland had a crop of 9 bushels above the average, while Middlesex, Northampton, Nottingham, Sussex, Gloucester, and Cumberland were from 3 to 5 bushels above. In Wales, Anglesey and Merioneth were 5 bushels below the average, the best counties being Pembroke and Brecon. A few Scottish counties did poorly, Nairn, Ross and Cromarty, and Bute particularly so, but good crops were secured in Berwick, Fife, Argyll, Inverness, and Sutherland. In Scotland as a whole, it may be noted, the yield of 37·73 bushels per acre is the second best on record, being about 1⅓ bushels below that of 1898.

Oats.—The somewhat dry season did not suit the oat crop, and the yield was two-thirds of a bushel under the average. This crop was worst in

England, where the deficiency averaged 1·3 bushels per acre. In Scotland the mean was slightly exceeded, and Wales had nearly ¾ of a bushel to the good. A few English counties did very well, such as Bedford, Cambridge, Gloucester, Hereford, and Somerset; the worst results being attained in the extreme north, particularly in Northumberland and the North Riding, and in Huntingdon, while the returns from Salop, Durham, and Derby were also low. Merioneth and Montgomery had very poor returns, Anglesey being the best of the Welsh counties. In Scotland the eastern division had almost universally poor results, the greatest deficiencies from the mean being reported from Berwick and Nairn as well as Ross and Cromarty: the western division, with the last-mentioned exception, generally did well, particularly Sutherland, Ayr, and Renfrew. The quality of the oats is not very favourably reported on.

Beans and Peas.—Beans were one of the best crops of the year, 4¾ bushels above the mean being secured. Not since 1891 have over a million quarters been harvested in Great Britain. The acreage was, however, much larger in the eighties, and the only occasion when the present yield per acre was exceeded was in 1890, when 32·65 bushels per acre was returned. In England the best results were secured in the midland counties, Leicester, Northampton, Nottingham, and Rutland all having 8 to 11 bushels over the average; results were more variable in the northern counties. The largest bean-growing county in Scotland, Stirling, also had 11 bushels above the average. Peas were below the average by nearly two-thirds of a bushel; on the small areas in Wales and Scotland slightly over-average crops were reported. The results in England were variable, and a failure was conspicuous in the county of Lincoln where much the largest acreage is grown, the crop there being 6½ bushels below average.

Potatoes.—Potatoes, although the total production is somewhat larger, have yielded rather less per acre than last year, but still 7 cwt. above the ten-year mean. Scotland was the most favoured of the three divisions of Great Britain, its 6·79 tons per acre being 18 cwt. above the average, and only a third of a ton below last year's record yield. The English and Welsh crops were 4 cwt. above the average. The eastern, and one or two western counties fared relatively badly, Wiltshire having 1¾ tons below the mean; while Norfolk, Huntingdon, and Cambridge fell short by fully a ton. From 1 to 2 tons above the average are returned from Buckinghamshire, Essex, Lancaster, Nottingham, Stafford, and Warwick. In Wales, Denbigh did best, and Merioneth the worst, while north of the Border, Berwick, Bute, Kinross, and the largest potato-growing county, Fife, all had over 2 tons to the good; the extreme north (Orkneys and Caithness) came off worst. Estimators generally mention the existence of disease, although some districts were reported as practically free.

Turnips and Swedes.—The yield of Turnips and Swedes was good, although not up to that of last year. England and Scotland had almost a ton above the average, but Wales was 2 tons below: the net result being an increase of 17 cwt. above the mean throughout Great Britain as a whole. The early summer was too dry for this crop in Wales and the north of England—Durham, Northumberland, Westmorland, Merioneth, and Montgomery all had from 4 to 5 tons below the mean. The best English counties were Buckinghamshire and Berkshire, followed by Bedford, Gloucester, Middlesex, Northants, Nottingham, Rutland, Wiltshire, and the East Riding. Inverness had 8½, and Caithness nearly 6 tons above the average.

Mangels.—Mangels did much better than turnips, and the estimate comes out exactly 2 tons more than the average for Great Britain as a whole. The past year's yield per acre has only been surpassed three times, and the total production only twice, in the preceding twenty years. The English yield was relatively rather better than that of the small Scotch area. An average yield of nearly 30 tons was returned from Derbyshire (nearly 7 tons over the average), while Cornwall, Gloucester, Somerset, Stafford, Wiltshire, Brecon, and Radnor all report over 25 tons to the acre, but the north of England was less successful.

Hay.—The Hay crop would appear to have been the least satisfactory of the year, both categories being below the average, although the yield from clover and rotation grasses was only very slightly deficient. This deficiency was less in England than in Scotland, while in Wales there was an excess of nearly ½ cwt. The results varied much in the different counties : the north of England suffered severely from the dry weather, and Cumberland had 10¾ cwt. below the average, while Northumberland and Westmorland had deficiencies of nearly 8 and over 5 cwt. respectively. The best results were secured in the south midland counties, particularly Bedford and Oxford. Results were also variable in Scotland : Bute, Caithness, Inverness, and Kinross exceeding the average by 4 cwt. or more ; and Dumbarton, Dumfries, Edinburgh, and Shetland falling short by as much. Hay from permanent grass was also below the average ; the deficiency in England reaching nearly 2 cwt. per acre. Only in the south was the yield above the average (Bedford and Middlesex being prominent), while the conditions grew worse as the extreme north was approached, even those counties which secured an average from the seeds having large deficiencies from their meadows. Northumberland showed the worst results (10⅔ cwt. below the average), Cumberland and Durham were 8 and 7 cwt. below the mean, while Westmorland, Yorkshire, and Nottingham were all from 4 to 6½ cwt. below. In Scotland, where, however, little permanent grass is cut for hay, very variable conditions prevailed, even contiguous counties showing quite divergent results. Taking both classes of hay together, the total yield of 1905 is estimated at 8,231,360 tons, as compared with 9,372,759 tons in 1904. This aggregate, however, compares less unfavourably with the average production of the ten years 1895-1904, which was 8,631,670 tons.

Hops.—The average yield of Hops exceeded 14 cwt. per acre. This is the largest on record, and almost 1½ cwt. above the high estimate of 1899, and 64 per cent. over a ten years' average. The sharp fluctuations of this crop are well illustrated by the estimate for 1905 exceeding by 140 per cent. the abnormally low yield of 1904. The total production, moreover, has only been once surpassed, viz., in 1886, when as many as 70,000 acres were under the crop. The yield of 1905 was highest (almost 16 cwt. per acre) in the Weald of Kent, while Hants also had over 15 cwt.

Crops of the United Kingdom.

Adding the total production of the principal crops in Ireland to those in Great Britain, the following Table shows the quantities harvested in the last three years in the United Kingdom. No estimates of production are furnished for the Isle of Man or the Channel Islands.

Crops	1903	1904	1905
	Qrs.	Qrs.	Qrs.
Wheat	6,102,000	4,740,000	7,542,000
Barley	8,164,000	7,807,000	8,125,000
Oats	21,618,000	22,094,000	20,786,000
	Tons	Tons	Tons
Potatoes	5,277,000	6,230,000	7,186,000
Turnips	23,523,000	28,033,000	26,563,000
Mangels	8,212,000	8,813,000	9,493,000
Hay (all sorts)	14,955,000	14,860,000	13,554,000

Acreage under Principal Crops and Grass in 1906.

Wheat.—The area under wheat in Great Britain in 1906 was 1,755,696 acres, being 41,299 acres, or rather more than 2 per cent., less than in 1905, in which year it will be remembered there was a notable increase of over

400,000 acres. The area now recorded still exceeds the average of the preceding five years by nearly 120,000 acres. Only in England was any decline apparent, Wales and Scotland adding 395 and 1,440 acres respectively to their acreage. The reduction in the wheat area was general in each division of England except the northern and north-western nearly every county of which showed an increase. The largest actual decreases were in Lincoln 5,364 acres, Norfolk 4,155 acres, Suffolk 3,475 acres, or about 3 per cent. in each case, and in Sussex 3,046 acres, or 6 per cent., these four counties accounting for more than a third of the total loss in England. Bedford, Essex, Gloucester, Northampton, Somerset, and Worcester each recorded a decreased wheat area of about 2,500 acres, while nine other counties reported losses averaging some 1,500 acres. In the northern and north-western division, Lancaster increased its area under wheat by 3,090 acres, or nearly 17 per cent., the North Riding by 2,768 acres, or nearly 10 per cent., Chester by 1,833 acres, or over 14 per cent., and Stafford by 1,508 acres, or 7 per cent. In Scotland, where the total addition to the wheat area amounted to 1,440 acres, or nearly 3 per cent., only five counties—Aberdeen, Berwick, Kincardine, Kinross, and Perth—showed a decline, while there was an increase in all the remaining counties, twenty-two in number, where wheat is grown.

Barley.—Barley, for the first time since 1900, showed an increase, the actual addition being 37,574 acres, or 2 per cent. This was practically equivalent to the decline in wheat, but the area under barley still remains less by 90,000 acres than in 1904. During the past thirty years the cultivation of this crop has declined by about 660,000 acres, and it may be noted that it now covers almost precisely the same extent of land as wheat. The increase in 1906 was principally in England, where an addition of 29,421 acres, or about 2 per cent., was recorded; Wales returning 1,591 acres and Scotland 6,562 acres more, the latter being relatively the largest increase of the three countries. In England, twenty-nine counties showed an increase, by far the largest addition in any single county being in Lincoln, the largest barley-growing county, where an increase of 11,896 acres, or about 6 per cent., was returned. The two counties next in importance, Norfolk and Suffolk, however, had a slightly diminished acreage under this crop. Hampshire had an increase of 2,772 acres, or over 9 per cent., and Nottingham one of 2,547 acres, or 8 per cent., while Salop, Stafford, Dorset, Durham, Devon, Cornwall, and Gloucester each substantially extended their barley acreage. Essex, with a loss of 2,700 acres, or nearly 4 per cent., was the most noticeable exception to the general rule. Nearly every county in Wales had an increase; while in Scotland the gains and losses were fairly distributed, the largest additions being in Aberdeen 1,613 acres, Perth 914 acres, Forfar 906 acres, and Berwick 887 acres.

Oats.—The decline in the area under oats, amounting to 8,450 acres, or 0·3 per cent., cannot be regarded as significant. The acreage is now 3,042,926 acres, or some 14,000 acres less than in 1902. This year's decline was confined to Wales and Scotland, mainly to the latter country, which lost 6,187 acres, Wales having a deficit of 2,819 acres, while England had a small increase of 556 acres. The changes were fairly distributed amongst the counties in England, twenty-one showing increases in their oat area and twenty-two recording decreases. The largest actual additions were in Norfolk 5,676 acres, Wilts 2,835 acres, Essex 2,317 acres, and Hertford 2,083 acres. Decreases occurred principally in the North Riding 3,197 acres, Salop 2,757 acres, Stafford 2,529 acres, Cornwall 2,412 acres, and Nottingham 2,029 acres. In Wales, three counties, Anglesey, Carnarvon, and Glamorgan, alone showed increases and in Scotland twenty-two counties contributed to the reduction of the acreage under oats. Amongst the Scottish counties which did not follow the general trend, Lanark was conspicuous with an addition of 1,338 acres.

Rye, Beans, and Peas.—Rye in 1906 showed a gain of 2,611 acres, or 4·2 per cent. In England, the principal additions occurred in Chester, Stafford, the East and North Ridings, and Lincoln, while Hampshire and Wiltshire each

lost nearly 700 acres. In Scotland several counties had considerable additions. There was a large increase in the area devoted to beans, and a corresponding decline in peas, the increase of the former being 34,126 acres, or 13·4 per cent., and the decrease of the latter 21,256 acres, or 12·1 per cent. It is necessary to go as far back as 1892 to find an area as large as the 288,891 acres devoted this year to the cultivation of beans, while the area under peas is the lowest ever recorded. Of the total increase in beans, 32,823 acres, or 96 per cent., occurred in England, every county, except Middlesex and Northumberland, recording additions, the largest of which were in Lincoln 5,600 acres, Essex 4,000 acres, Cambridge 2,300 acres, Suffolk 1,800 acres, and Northampton 1,700 acres, while in several other counties 1,000 acres were added. The decrease in peas was practically all in England, where only ten counties recorded comparatively small increases. There was a large decrease in Lincoln, the chief pea-growing county, amounting to 8,200 acres, or nearly 28 per cent., while Norfolk, Essex, Kent, and Northampton had reductions of over 1,000 acres.

Potatoes.—Potatoes more than lost the area added in 1905, a decline of 42,552 acres, or 7 per cent., reducing the acreage to 565,921 acres, or very little in excess of the area returned in 1903. The large crop of last year, and the low prices subsequently prevailing, probably account for this diminution. The decrease was mainly in England, where it amounted to 38,257 acres, all but nine counties sharing in the loss, and it was most marked in the chief potato-growing county of Lincoln, where the reduction amounted to 14,428 acres, or 18 per cent. The area under potatoes in Lincolnshire has steadily increased in each year from 1897, when it stood at 50,197 acres, to 1905, when it attained its maximum of nearly 80,000 acres, being an increase during that period of 29,367 acres, or 58 per cent. The loss this year practically reduces the area to the same as in 1900. Several other counties had relatively large decreases, such as the West Riding 3,487 acres, Cambridge 2,954 acres, and the East Riding 2,300 acres. The loss in Wales was only slight, but the decline which has been in progress since 1888 still continues, and in Scotland the diminution amounted to just over 4,000 acres, or nearly 3 per cent.

Root Crops, &c.—The acreage under turnips and swedes, for the second time on record, fell below 1,600,000 acres, but was slightly in excess of the area returned last year. The decline in the area devoted to these crops has been almost continuous since 1876. For ten years, 1877-1886, the acreage stood at something over 2,000,000 acres but below 2,100,000 acres, the average area during the period being 2,028,000 acres : for the succeeding nine years, from 1887-1895, over 1,900,000 but under 2,000,000 acres were returned, the average area being 1,943,000 acres. Since 1895 the decline has been more rapid, and in the last ten years 327,000 acres have been lost to these crops. In the present year both England and Wales exhibited small losses, reducing their acreage to the lowest on record, but Scotland adds 3,650 acres to the turnip and swede area, or an 8 per cent increase. The differences in England were evenly distributed, Hampshire claiming an addition of 2,172 acres, while Norfolk lost 2,818 acres, Suffolk 1,381 acres, and Salop 1,285 acres. In Scotland, Fife, Kirkcudbright, Perth, Dumfries, and Forfar had the largest increases. A considerable addition was made to the mangel area, which was returned at 431,458 acres, as compared with 404,123 acres last year, the increase being 27,335 acres, or 6·8 per cent. Only once before has the present acreage been exceeded, viz., in 1902, when it was exactly 10,000 acres more than at present. There appears to have been comparatively little permanent addition to the acreage devoted to mangels between the years 1876-1895, the average in the first five years of that period being 351,000 acres, while in the last five years of the period it was 350,000 acres, but in the two succeeding five-yearly periods the average area increased, in the former to 367,000 acres, and in 1901-1905 to 409,000 acres. The increase this year was almost wholly in England, every county recording a larger area, the most notable increases occurring in Norfolk, Yorkshire, and Salop. Cabbage continues to increase in area, the addition in 1906 amounting to 4 per cent. on

the whole of the country. Most counties extended their acreage under this crop, the most prominent exception being Essex, where a loss of 8 per cent. was returned. Kent and Essex have now almost an equal area under this crop, and, together, account for one-sixth of the total acreage. Very little change has occurred in the acreage returned under kohl rabi, the increase not reaching 1 per cent., including an addition in Essex, which contains nearly one-fourth of the whole English acreage of this crop. Rape also showed little alteration from last year's acreage. England had a decrease of 908 acres, which was nearly balanced by the increases in Wales and Scotland. The most noticeable loss in any one county was in Hertford, where there was a deficit of over 600 acres. Vetches or tares increased by 5,600 acres, nearly the whole of which was in England, the East Riding being credited with the addition of nearly 1,300 acres, or 37 per cent. The reduction in lucerne which was noticed last year has been recovered. The increase principally occurred in England, nearly half the area gained being in Essex, the chief lucerne-growing county. Kent the next largest county, however, showed a decline of 487 acres. Among other crops, the area under carrots showed a small increase, and now stands at 12,845 acres; 3,287 acres were returned as under onions, being an increase of nearly 16 per cent. on the previous year's figures. The area devoted to flax-growing fell from 441 acres to 263 acres, nearly the whole of the decrease being found in the East Riding.

Hops and Fruit.—The area returned under hops was the lowest on record, the decline of 2,245 acres, or 4·6 per cent., reducing the total to 46,722 acres, or more than 1,000 acres below the previous minimum acreage in 1904. The decrease was general—Kent losing 1,359 acres, Hereford 370 acres, and Sussex 268 acres. The area under small fruit again increased, and for the first time since the returns have been collected exceeded 80,000 acres. Each of the three divisions of Great Britain added to its small fruit area, but the gains were relatively greater in Scotland and Wales than in England. The largest actual and relative addition in England is in Norfolk, where 452 acres, or over 10 per cent., were brought under fruit in 1906. In Perth the increase was 258 acres, or 13 per cent., and in Lanark there was an extension of 121 acres, each of these counties now devoting over 2,000 acres to the growth of small fruit. Over 3,300 acres were added in 1906 to the area of orchards, nearly every county in England contributing to this result.

Grass and Clover.—Of the total area returned under clover and rotation grasses, there was a net decrease of 36,772 acres, or slightly under 1 per cent. This decrease was mainly in the area returned as "not for hay," which, separately considered, showed a deficit of nearly 40,000 acres. In the area returned as "for hay," England showed an increase, which was principally found in the east and north-eastern counties, and in the midland and northern counties, while a decrease was general in the south-eastern and south-western counties. The largest actual additions occurred in Norfolk 6,188 acres, Lincoln 5,472 acres, and Suffolk 5,431 acres, while Hampshire had a decline of 4,562 acres, Wiltshire 3,659 acres, Somerset 2,472 acres, Dorset 2,464 acres, and Sussex 2,359 acres. In Scotland the chief losses occurred in Aberdeen, Forfar, and Perth. The decrease in rotation grasses not for hay was almost universal in England, only seven counties reporting increases. In Devon there was a decline of over 6,000 acres, while Cumberland lost nearly 4,000 acres, and Stafford and Wiltshire 3,000 acres each. Wales, on the contrary, had an increase of 3,000 acres, while the area in Scotland was practically the same as last year. A further addition was made to the area under permanent grass, and the total, 17,244,734 acres, is the highest recorded. The area reserved for mowing this year showed an increase of nearly 100,000 acres, principally in England. Wales also had a small increase of 4,600 acres, but Scotland returned a decrease of nearly 4,000 acres. In England, the most noticeable additions occurred in Somerset 10,000 acres, Gloucester, Warwick, and the West Riding with some 7,500 each, Stafford with 7,000 acres, and Wiltshire, Leicester, and Worcester with about 5,000 acres each.

Numbers of Live Stock in Great Britain in 1906.

Horses.—The number of horses included in these Returns reached in 1905 a total larger than ever previously recorded, but a decrease of 3,752 is shown in the present year's Returns. It will be noted that the reduction occurs in the agricultural horses (which include mares kept for breeding) and in the unbroken horses under one year, and that taking these classes alone there is a decline of 8,654. The increase of 4,902 in the unbroken horses of one year and above is in some degree a consequence of the previous year's increase, and is not therefore quite so satisfactory a set-off as the figures might suggest. The number of unbroken horses under one year may be regarded as some index to horse-breeding in this country, and it is of interest to note that during the seven years prior to 1906 there appears to have been a slow but steady increase.

Cattle.—The steady increase in the number of cattle which has taken place in Great Britain since 1902 was again continued this year, and with the addition of 23,836 to their number the herds of the country for the first time exceeded seven million head. It must be noted, however, that the increase only occurred in England and Wales; the Scottish counties, with three exceptions (Aberdeen, Wigtown and Clackmannan), exhibiting more or less considerable reductions. Foremost in this respect were the eastern counties of Haddington, Forfar, Berwick and Roxburgh. Even in England thirteen counties showed decreases in the number of their cattle, but it is of some interest to note that this backward movement is only significant in the four northern counties of Northumberland, Cumberland, Durham, and the North Riding, and in Stafford. These losses were far outweighed by substantial gains in other counties, prominent amongst which stand Devon 5,773, Suffolk 5,168, Essex 4,773, and Hampshire 4,214. With the exception of Merioneth and Radnor all the Welsh counties showed an increase. The increase in the total number of cattle in Great Britain masks a somewhat serious decline of 42,345, or 3 per cent., in the number under one year old. The heaviest losses in this category occurred in Somerset 2,950, Gloucester 2,755, Salop 2,255, Chester 2,253, Norfolk 2,088, and Stafford 2,036. Only nine counties in England and Wales, and Clackmannan alone in Scotland, furnish exceptions to the general decrease in cattle under one year, which is perhaps the least satisfactory feature of the present year's live-stock statistics. As regards older cattle, cows and heifers showed a slight falling off in Scotland, and a considerable advance in England and Wales. The net increase of 31,019 (1·1 per cent.) in Great Britain brought the total to 2,738,411, the highest figure yet attained. The counties where the largest increases were recorded are Hampshire 3,419, Lancaster 3,138, Essex, and Devon. In the two remaining classes of cattle, comprising those over one year, exclusive of cows and heifers in-milk or in-calf, the general movement was upward in England and Wales—the northernmost counties of Northumberland, Cumberland, and Durham furnishing conspicuous exceptions—and downward in Scotland, where Aberdeen and Wigtown alone showed any marked growth in numbers. The net result was an increase of 35,162 in Great Britain as a whole.

Sheep.—There is an increase of 163,164 (0·6 per cent.) in the number of sheep enumerated this year. Except in Wales, however, the local changes exhibit a lack of uniformity. Thus, in England, while the West Riding, Kent, and Salop showed large increases, the East Riding, Suffolk, and Norfolk recorded smaller, but, nevertheless, considerable decreases. The net gain in England was 141,909, and in Wales 51,128. In half the Scotch counties there were increases, amounting in one case (Aberdeen) to over 10,000 head. Heavy losses, however, in the remaining counties, particularly Perth 10,019, Shetland 8,863, Argyll 8,475, and Lanark 6,715, reduced the number of sheep in Scotland nearly 30,000 below the total of 1905. Turning to the detailed figures for the three classes of sheep enumerated, it is to be observed that the number of ewes kept for breeding increased in nearly every part of Great Britain, the only noteworthy exceptions being Suffolk, Norfolk, and Dorset in England, Cardigan in Wales, and Shetland, Perth, and Argyll in Scotland. As regards sheep of

[Continued on page 332.]

TABLE I.—Acreage under Crops and Grass; *and* Number *of* Live 1906, *and June* 5, 1905, *in each Division of Great Britain*,

Crops and Grass	England		Wales	
	1906	1905	1906	1905
	Acres	Acres	Acres	Acres
Total Area (excluding water)	32,382,550	32,382,550	4,748,624	4,748,624
Total Acreage under Crops and Grass	24,600,574	24,611,186	2,793,142	2,794,661
CORN CROPS:—				
Wheat	1,661,147	1,704,281	44,468	44,073
Barley or Bere	1,439,708	1,410,287	92,834	91,243
Oats	1,881,031	1,880,475	205,110	207,929
Rye	56,993	55,454	1,068	1,145
Beans	276,065	243,242	1,306	1,177
Peas	152,138	173,384	860	941
TOTAL	5,467,082	5,467,123	345,646	346,508
GREEN CROPS:—				
Potatoes	396,516	434,773	29,219	29,435
Turnips and Swedes	1,082,821	1,083,640	59,143	60,327
Mangel	418,415	391,712	10,621	10,002
Cabbage, K. Rabi and Rape	161,464	159,914	5,232	4,587
Vetches or Tares	132,378	126,934	989	938
Other Crops	165,847	155,994	1,288	1,262
TOTAL	2,357,441	2,352,967	106,492	106,551
Clover, Sainfoin, and Grasses under Rotation[2] — For Hay	1,576,114	1,569,430	190,281	192,170
Clover, Sainfoin, and Grasses under Rotation[2] — Not for Hay	962,419	1,004,535	156,284	153,106
TOTAL	2,538,533	2,573,965	346,565	345,276
Permanent Pasture or Grass, not broken up in Rotation[2] — For Hay	4,130,262	4,033,908	510,831	506,270
Permanent Pasture or Grass, not broken up in Rotation[2] — Not for Hay	9,686,962	9,726,684	1,476,554	1,482,906
TOTAL	13,817,224	13,760,592	1,987,385	1,989,176
Hops	46,722	48,967	—	—
Small Fruit	71,978	71,119	1,289	1,213
Bare Fallow	301,594	336,453	5,765	5,917
Live Stock	No.	No.	No.	No.
Horses used for Agriculture	865,783	871,082	94,801	94,817
Unbroken Horses:—one year and above	234,779	230,994	44,614	43,775
Unbroken Horses:—Under one year	99,918	102,048	22,604	23,331
TOTAL OF HORSES	1,200,480	1,204,124	162,019	161,923
Cows and Heifers in-milk or in-calf	2,020,340	1,990,402	283,595	279,852
Other Cattle:—				
Two years and above	1,067,697	1,048,518	94,782	90,469
One year and under two	1,031,866	1,007,496	181,416	178,534
Under one year	940,959	974,520	187,922	189,934
TOTAL OF CATTLE	5,060,862	5,020,936	747,715	738,789
Breeding Ewes	5,665,006	5,582,054	1,460,903	1,435,168
Other Sheep:—				
One year and above	2,942,696	2,951,485	820,358	812,832
Under one year	6,232,225	6,164,479	1,304,834	1,286,967
TOTAL OF SHEEP	14,839,927	14,698,018	3,586,095	3,534,967
Breeding Sows	284,950	285,372	34,480	33,439
Other Pigs	1,698,652	1,797,854	175,180	178,040
TOTAL OF PIGS	1,983,602	2,083,226	209,660	211,479

[1] Including Channel Islands and the Isle of Man.

[2] Not including mountain and heath land. The apparent changes in the area classification, and to the transfer of some grass land from one category to another, or 2,244,708 acres in Ireland in 1906.

Stock (Horses, Cattle, Sheep, *and* Pigs), *as returned on June* 4, *with Particulars for Ireland and Total for the United Kingdom.*

Scotland		Ireland		United Kingdom[1]	
1906	1905	1906	1905	1906	1905
Acres 19,070,244	Acres 19,070,244	Acres 20,710,589	Acres 20,710,589	Acres 77,097,460	Acres 77,097,460
4,873,039	4,880,985	14,804,299	15,262,949	47,195,879	47,673,115
50,081	48,641	43,880	37,860	1,801,271	1,836,598
218,696	212,134	176,544	154,645	1,931,651	1,872,305
956,785	962,972	1,076,310	1,066,806	4,138,407	4,137,406
6,747	5,598	10,343	10,155	75,422	72,480
11,520	10,346	1,961	1,471	290,980	256,383
981	910	305	253	154,434	175,624
1,244,810	1,240,601	1,309,343	1,271,190	8,392,165	8,350,796
140,186	144,265	616,107	616,755	1,193,662	1,236,768
448,956	445,306	278,367	282,105	1,877,505	1,879,384
2,422	2,389	67,200	72,570	499,443	477,540
15,216	14,725	44,410	45,695	226,880	225,315
8,680	8,557	2,620	2,566	144,949	139,285
2,859	2,703	80,181	70,840	252,047	232,681
618,319	617,945	1,088,885	1,090,531	4,194,486	4,190,973
425,192	427,686	780,248	628,635	2,985,194	2,831,305
1,130,456	1,130,591	1,438,325	626,478	3,721,718	2,948,018
1,555,648	1,558,277	2,218,573[2]	1,255,113	6,706,912	5,779,323
143,802	148,342	1,549,768	1,665,871	6,341,694	6,361,439
1,296,323	1,302,384	8,624,705	9,971,518	21,105,090	22,503,934
1,440,125	1,450,726	10,174,473[2]	11,637,389	27,446,784	28,865,373
—	—	—	—	46,722	48,967
6,959	6,493	10,602	4,531	91,510	83,941
7,178	6,943	2,423	4,195	317,299	353,742
No. 155,921	No. 156,520	No. 370,551	No. 373,184	No. 1,494,242	No. 1,502,941
35,842	35,564	99,477	94,566	416,267	406,316
14,419	14,302	61,830	67,125	199,515	207,543
206,182	206,386	531,858	534,875	2,110,024	2,116,800
434,476	437,138	1,496,284	1,487,064	4,252,286	4,211,916
264,275	276,330	1,058,681	1,041,306	2,490,805	2,461,813
281,513	285,040	1,000,343	1,024,638	2,505,107	2,505,714
222,015	228,787	1,083,616	1,092,207	2,443,757	2,494,576
1,202,279	1,227,295	4,638,924	4,645,215	11,691,955	11,674,019
2,935,195	2,918,544	1,480,210	1,506,350	11,573,516	11,471,873
1,335,822	1,383,200	680,388	688,301	5,784,597	5,840,930
2,723,321	2,722,467	1,554,234	1,554,701	11,851,922	11,763,974
6,994,338	7,024,211	3,714,832	3,749,352	29,210,035	29,076,777
16,892	16,197	134,478	121,840	472,773	458,689
113,307	114,017	1,109,715	1,042,476	3,107,967	3,142,970
130,199	130,214	1,244,193	1,164,316	3,580,740	3,601,659

under grass in Ireland, as compared with 1905, are largely due to greater care in to a new item, "grazed mountain land." The area of this latter was returned at

TABLE II.—*Estimated* **Total Produce and Yield per Acre** *of the* **Principal Crops** *in England, Wales, Scotland, Great Britain, Ireland, and the United Kingdom for the years* 1905 *and* 1904.

Crops	England				Wales			
	Total produce		Yield per acre		Total produce		Yield per acre	
	1905	1904	1905	1904	1905	1904	1905	1904
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat	55,669,890	34,535,897	32·66	26·52	1,167,228	890,800	26·59	25·41
Barley	47,288,182	47,028,421	33·53	30·47	2,817,436	2,983,409	30·88	30·97
Oats	74,116,954	84,078,623	39·41	40·82	7,042,126	7,426,363	33·87	34·99
Beans	7,806,620	5,434,859	32·13	22·61	30,292	29,851	25·89	24·27
Peas	4,403,110	4,406,000	25·73	25·77	19,265	19,728	20·54	21·61
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Potatoes	2,619,276	2,462,613	6·02	6·11	163,889	143,964	5·57	4·84
Turnips	13,906,669	14,240,944	12·83	13·05	771,119	1,000,805	12·78	16·40
Mangels	8,002,318	7,252,440	20·43	18·81	165,833	180,615	16·55	17·69
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Hops	695,943	282,330	14·21	5·91	—	—	—	—
	Tons	Tons	Cwt.	Cwt.	Tons	Tons	Cwt.	Cwt.
Hay from clover, sainfoin, &c.	2,243,803	2,542,597	28·59	29·94	232,655	252,612	24·21	24·88
Hay from permanent pasture	4,395,360	5,140,332	21·79	24·97	482,649	511,248	19·07	20·34
Hay of all kinds	6,639,163	7,682,929	—	—	715,304	763,860	—	—

Crops	Scotland				Great Britain			
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat	2,065,381	1,453,549	42·46	38·53	58,902,499	36,800,246	32·78	26·82
Barley	8,004,446	7,181,237	37·73	35·77	58,110,064	57,193,067	33·91	31·07
Oats	35,277,807	35,902,862	36·63	36·61	116,436,887	127,407,848	38·16	39·17
Beans	364,818	363,079	36·76	34·53	8,201,730	5,827,789	32·28	23·12
Peas	17,108	15,375	27·16	26·74	4,439,483	4,441,103	25·71	25·75
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Potatoes	979,541	981,677	6·79	7·13	3,762,706	3,588,254	6·18	6·29
Turnips	7,162,794	7,794,380	16·08	17·25	21,840,582	23,036,129	13·74	14·36
Mangels	45,109	48,347	18·94	16·28	8,213,260	7,481,402	20·32	18·76
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Hops	—	—	—	—	695,943	282,330	14·21	5·91
	Tons	Tons	Cwt.	Cwt.	Tons	Tons	Cwt.	Cwt.
Hay from clover, sainfoin, &c.	666,985	701,854	31·19	33·31	3,143,443	3,497,063	28·72	30·11
Hay from permanent pasture	209,908	224,116	28·46	30·93	5,087,917	5,875,696	21·71	24·66
Hay of all kinds	876,893	925,970	—	—	8,231,360	9,372,759	—	—

Crops	Ireland				United Kingdom			
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat	1,430,154	1,039,535	37·77	33·72	60,332,653	37,919,781	32·88	26·97
Barley	6,893,495	5,260,416	44·58	33·27	65,003,559	62,453,483	34·79	31·25
Oats	49,849,509	49,347,200	46·73	45·74	166,286,396	176,755,048	40·38	40·80
Beans	59,967	73,005	40·77	38·63	8,261,697	5,900,794	32·33	23·23
Peas	6,567	4,682	25·96	25·31	4,446,050	4,445,785	25·71	25·75
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Potatoes	3,423,039	2,642,018	5·55	4·27	7,185,745	6,230,272	5·86	5·24
Turnips	4,722,478	4,997,245	16·74	17·48	26,563,060	28,033,374	14·19	14·83
Mangels	1,279,842	1,331,609	17·64	17·58	9,493,102	8,813,011	19·91	18·57
	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.	Cwt.
Hops	—	—	—	—	695,943	282,330	14·21	5·91
	Tons	Tons	Cwt.	Cwt.	Tons	Tons	Cwt.	Cwt.
Hay from clover, sainfoin, &c.	1,399,109	1,441,461	44·51	45·63	4,542,552	4,938,524	32·24	33·43
Hay from permanent pasture	3,923,481	4,045,469	47·10	49·69	9,011,398	9,921,165	28·37	31·04
Hay of all kinds	5,322,590	5,486,930	—	—	13,553,950	14,859,689	—	—

TABLE III.—*Preliminary Statement showing the Estimated* **Total Produce and Yield per Acre** *of the* **Principal Crops** *in Great Britain in the year* 1906, *and the Average Yield per Acre in Great Britain of the Ten Years*, 1896-1905.

Crops	England		Wales		Scotland		Great Britain		Average of ten years, 1896-1905, Great Britain
	Total produce	Yield per acre	Total produce	Yield per acre	Total produce	Yield per acre	Total produce	Yield per acre	
	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.	Bush.
Wheat . .	55,823,839	33·61	1,268,112	28·56	1,999,821	39·95	59,091,772	33·66	31·22
Barley . .	49,968,508	34·71	3,020,608	32·54	7,564,861	34·59	60,553,977	34·58	33·04
Oats . . .	81,532,511	43·34	7,816,634	38·11	34,034,712	35·57	123,383,857	40·55	38·92
Beans . .	9,526,457	34·67	38,046	29·27	406,389	36·96	9,970,892	34·73	28·59
Peas . . .	4,475,332	30·23	23,291	27·15	17,160	28·70	4,515,783	30·21	26·61
	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons	Tons
Potatoes .	2,439,063	6·15	143,420	4·91	846,228	6·04	3,428,711	6·06	5·78
Turnips. .	14,104,146	13·03	934,997	15·81	7,588,697	16·90	22,627,840	14·22	12·96
Mangels .	8,288,300	19·81	203,385	19·15	46,795	19·44	8,538,480	19·79	18·70
	Tons	Cwt.	Tons	Cwt.	Tons	Cwt.	Tons	Cwt.	Cwt.
Hay[1] . .	2,205,545	27·99	258,246	27·14	737,178	34·68	3,200,969	29·21	29·06
Hay[2] . .	4,618,526	22·36	545,942	21·37	220,424	30·72	5,384,892	22·51	23·49

[1] Hay from clover, sainfoin, &c. [2] Hay from permanent pasture.

TABLE IV.—*Preliminary Statement showing the Estimated Total Production of* **Hops** *in the Years* 1906 *and* 1905, *with the Acreage and Estimated Average Yield per Statute Acre, in each County of England in which Hops were grown.*

Counties	Estimated total produce		Acreage		Estimated average yield per acre	
	1906	1905	1906	1905	1906	1905
	Cwt.	Cwt.	Acres	Acres	Cwt.	Cwt.
Hants . . .	10,263	30,207	1,939	1,978	5·29	15·27
Hereford . .	24,953	88,802	6,481	6,851	3·85	12·96
Kent . . .	166,631	443,470	29,296	30,655	5·69	14·47
Salop . . .	442	1,626	127	135	3·48	12·04
Surrey . . .	3,399	10,248	777	843	4·37	12·16
Sussex . . .	22,070	69,059	4,379	4,647	5·04	14·86
Worcester . .	17,893	51,961	3,672	3,807	4·87	13·65
Other Counties[1] .	37	570	51	51	0·72	11·18
Total . .	245,688	695,943	46,722	48,967	5·26	14·21

NOTE.—The following counties show *decreased acreages* in 1906 to the extent named:—Hants, 39 acres; Hereford, 370 acres; Kent, 1,359 acres; Salop, 8 acres; Surrey, 66 acres; Sussex, 268 acres; Worcester, 135 acres.

The total decrease on the year is 2,245 acres.

[1] Gloucester and Suffolk.

TABLE V.—*Average Prices of* **British Corn** *per Imperial Quarter in England and Wales, as ascertained under the Corn Returns Act*, 1882, *in each Week of the Year* 1905.

Week ended	Wheat	Barley	Oats	Week ended	Wheat	Barley	Oats
	s. *d.*	*s.* *d.*	*s.* *d.*		*s.* *d.*	*s.* *d.*	*s.* *d.*
January 7	30 4	24 4	16 3	July 1	31 8	23 2	19 7
January 14	30 4	24 6	16 3	July 8	32 1	22 11	19 6
January 21	30 5	25 0	16 5	July 15	32 3	23 10	19 7
January 28	30 6	25 1	16 7	July 22	32 2	23 7	18 11
February 4	30 6	25 0	16 7	July 29	32 3	23 11	19 3
February 11	30 7	25 2	16 8	August 5	31 11	22 0	18 4
February 18	30 5	25 2	16 9	August 12	30 5	22 5	16 11
February 25	30 10	25 0	16 10	August 19	28 5	23 4	16 4
March 4	30 8	25 2	16 10	August 26	27 1	23 6	15 9
March 11	30 9	25 2	16 10	September 2	26 11	23 5	15 9
March 18	30 10	24 11	16 10	September 9	27 1	23 4	15 11
March 25	30 9	25 2	17 0	September 16	26 11	23 7	16 0
April 1	30 9	25 1	16 11	September 23	26 8	23 10	15 11
April 8	30 9	25 6	17 0	September 30	26 9	24 3	16 1
April 15	30 8	24 3	17 6	October 7	26 9	24 9	16 3
April 22	30 8	24 4	17 5	October 14	26 11	24 10	16 6
April 29	30 9	24 4	17 9	October 21	27 1	25 0	16 7
May 6	30 8	25 3	18 0	October 28	27 4	24 11	16 8
May 13	30 8	24 10	18 3	November 4	27 10	24 9	17 1
May 20	30 10	24 8	18 5	November 11	28 3	24 10	17 4
May 27	30 11	24 4	18 8	November 18	28 7	24 6	17 8
June 3	31 3	23 6	19 1	November 25	28 5	24 6	17 9
June 10	31 4	24 0	18 11	December 2	28 8	24 6	17 11
June 17	31 7	26 0	19 1	December 9	28 6	24 7	17 11
June 24	31 7	23 9	18 10	December 16	28 5	24 5	17 11
				December 23	28 4	24 6	17 11
				December 30	28 3	24 7	18 1
				Average of year.	29 8	24 4	17 4

TABLE VI.—*Average Prices of* **British Corn** *per Imperial Quarter in England and Wales, as ascertained under the Corn Returns Act*, 1882, *in each Week of the Year* 1906.

Week ended	Wheat	Barley	Oats	Week ended	Wheat	Barley	Oats
	s. *d.*	*s.* *d*	*s.* *d.*		*s.* *d.*	*s.* *d.*	*s.* *d.*
January 6	28 4	24 6	18 2	July 7	30 2	23 0	20 2
January 13	28 6	24 8	18 4	July 14	30 5	23 8	20 4
January 20	28 5	24 11	18 4	July 21	30 3	23 2	20 5
January 27	28 7	25 1	18 7	July 28	30 5	22 4	20 2
February 3	28 10	25 1	18 10	August 4	30 9	22 1	19 3
February 10	28 10	25 3	18 10	August 11	30 5	23 0	17 11
February 17	28 11	25 6	19 0	August 18	29 0	24 2	17 0
February 24	28 10	25 4	19 0	August 25	27 9	25 0	16 10
March 3	28 8	25 0	19 0	September 1	26 9	24 3	16 6
March 10	28 5	25 1	18 8	September 8	26 4	24 9	16 3
March 17	28 5	24 8	18 10	September 15	25 11	24 3	16 1
March 24	28 4	24 4	18 8	September 22	25 9	24 3	16 0
March 31	28 3	24 5	18 11	September 29	25 9	24 8	16 2
April 7	28 7	24 2	18 11	October 6	26 1	25 0	16 3
April 14	28 11	24 4	19 4	October 13	26 3	25 3	16 7
April 21	29 4	24 0	19 1	October 20	26 6	24 10	16 8
April 28	29 6	24 0	19 6	October 27	26 7	24 10	16 10
May 5	29 10	23 10	19 9	November 3	26 7	24 8	16 11
May 12	30 1	24 1	20 0	November 10	26 6	24 8	17 1
May 19	30 3	23 10	20 1	November 17	26 4	24 4	17 2
May 26	30 4	24 2	20 2	November 24	26 3	24 1	17 3
June 2	30 4	22 10	20 5	December 1	26 1	24 1	17 2
June 9	30 3	23 4	19 11	December 8	26 1	24 1	17 4
June 16	30 4	23 6	20 2	December 15	26 1	23 11	17 3
June 23	30 5	22 10	20 2	December 22	26 3	24 3	17 3
June 30	30 3	24 3	20 1	December 29	26 0	24 1	17 3
				Average of year.	28 3	24 2	18 4

TABLE VII.—*Average Prices per Imperial Quarter and Quantities of* **British Corn** *returned as sold in the Towns in England and Wales from which Returns were received under the Corn Returns Act*, 1882, *in each of the Years* 1897 *to* 1906.

Year	Wheat	Barley	Oats	Wheat	Barley	Oats
	s. *d.*	*s.* *d.*	*s.* *d.*	Qrs.	Qrs.	Qrs.
1897	30 2	23 6	16 11	2,756,561	3,257,187	550,434
1898	34 0	27 2	18 5	2,602,416	3,653,657	688,064
1899	25 8	25 7	17 0	3,530,961	3,296,744	776,361
1900	26 11	24 11	17 7	2,923,483	3,190,793	711,784
1901	26 9	25 2	18 5	2,605,550	3,369,629	714,215
1902	28 1	25 8	20 2	2,247,937	2,783,424	831,285
1903	26 9	22 8	17 2	2,296,723	2,875,749	1,049,995
1904	28 4	22 4	16 4	2,138,142	3,437,176	1,316,516
1905	29 8	24 4	17 4	2,467,551	3,265,613	1,073,611
1906	28 3	24 2	18 4	2,684,101	3,210,995	1,011,931

TABLE VIII.—*Annual and Septennial Average Prices per Imperial Bushel of* **British Wheat, Barley,** *and* **Oats** *in each Year from* 1897 *to* 1906 *inclusive, with the Value of* 100*l. of Tithe Rent-charge.*

Year	Annual average price						Septennial average price						Value of tithe rent-charge of 100*l.*					
	Wheat		Barley		Oats		Wheat		Barley		Oats		Calculated on annual average			Calculated on septennial average		
	s.	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*
1897	3	9¼	2	11¼	2	1¼	3	5¾	3	1	2	2	68	2	10¾	68	14	11
1898	4	3	3	4¾	2	3½	3	5¼	3	0¾	2	1¾	76	11	0½	68	2	4¾
1899	3	2½	3	2¼	2	1½	3	4¼	3	0½	2	1	67	16	7½	66	15	9¾
1900	3	4¼	3	1¼	2	2¼	3	4¼	3	0½	2	0¾	68	11	7¼	66	10	9¼
1901	3	4	3	1¾	2	3½	3	5¼	3	0½	2	1	70	1	10¾	67	3	8¾
1902	3	6	3	2½	2	6¼	3	6¼	3	1¼	2	2¼	74	3	9½	69	7	5
1903	3	4	2	10	2	1¾	3	6½	3	1¼	2	2¾	65	13	10¾	69	19	6
1904	3	6½	2	9½	2	0½	3	6	3	1	2	2¾	65	1	5	69	12	0½
1905	3	8½	3	0½	2	2	3	5	3	0½	2	2½	69	9	7¾	68	12	0¾
1906	3	6¼	3	0¼	2	3½	3	5¾	3	0¼	2	2¾	69	18	7¾	68	19	6½

TABLE IX.—*Average Prices of* **Wool** *in each of the Years* 1899 *to* 1905.

Year	ENGLISH				AUSTRALIAN[3]	NEW ZEALAND[3]	SOUTH AFRICAN[3]
	Leicester[1]	Half-breds[1]	Southdown[1]	Lincoln[2]			
	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.	Per lb.
	d.	*d.*	*d.*	*d.*	*d.*	*d.*	*d.*
1899	7 to 8	7 to 8¼	7¾ to 11	8¼	9⅜	8	7⅞
1900	6¼ „ 7½	6¾ „ 8¾	8 „ 12	7⅞	11	8½	8⅜
1901	5½ „ 6	5½ „ 9¼	7¼ „ 9¼	6⅞	8¼	6⅝	7
1902	5 „ 5⅝	5⅜ „ 6⅞	7⅛ „ 9⅛	6¼	8⅝	6⅛	7⅜
1903	6½ „ 6⅞	7⅛ „ 8	8½ „ 11½	7¼	9⅞	7⅜	7½
1904	8⅞ „ 9⅝	9½ „ 10⅛	9½ „ 11¾	10½	10	8½	7⅝
1905	11⅜ „ 12	11⅝ „ 12¾	11⅞ „ 13¼	12½	10¼	9¾	7⅝

[1] Computed from the prices given weekly in *The Economist* newspaper.
[2] Prices extracted from "*The Yorkshire Daily Observer* Wool Tables."
[3] Calculated from the Trade and Navigation Accounts.

TABLE X.—*Average Prices of* **Fat Cattle** *per cwt. (Live Weight) at the undermentioned places in England and Scotland, for the years* 1898 *to* 1905 *inclusive. Compiled from the Returns received under the Markets and Fairs (Weighing of Cattle) Act,* 1891.

Places	1898	1899	1900	1901	1902	1903	1904	1905
ENGLAND—	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*	*s. d.*
Carlisle	29 2	31 4	33 2	32 2	33 2	33 6	31 11	31 6
Leeds	31 6	31 10	33 6	33 0	35 6	34 4	33 4	32 11
Leicester	—	32 2	32 10	33 2	35 2	33 6	32 2	32 9
Liverpool	31 4	32 10	34 6	33 0	34 10	32 8	32 1	31 3
London	34 6	36 8	38 0	37 0	39 4	36 4	35 6	35 4
Newcastle	32 6	35 6	37 10	36 0	38 10	37 0	36 2	34 8
Shrewsbury	29 8	32 2	33 4	32 10	33 10	33 6	31 9	31 6
SCOTLAND—								
Aberdeen	31 0	32 10	34 3	32 10	34 9	33 4	32 8	32 6
Dundee	31 10	33 0	34 7	33 6	34 11	33 3	32 7	32 0
Edinburgh	32 9	34 9	36 5	35 3	37 4	35 5	34 10	33 10
Glasgow	32 11	34 4	35 11	35 5	37 10	36 3	35 8	32 6
Perth	32 9	34 7	37 7	36 9	37 4	35 1	33 3	34 4
England	31 6	33 4	34 11	33 9	35 5	34 1	33 1	32 8
Scotland	32 0	33 8	35 3	34 1	36 2	34 6	33 9	33 0
Great Britain	31 10	33 7	35 2	34 0	35 11	34 4	33 7	32 11

TABLE XI.—*Quantities and Values of* **Corn**, *&c., Imported into the United Kingdom in the Years* 1904, 1905, *and* 1906.

[*From Trade and Navigation Accounts.*]

—	Quantities			Values		
	1904	1905	1906	1904	1905	1906
CORN:	Cwt.	Cwt.	Cwt.	£	£	£
Wheat	97,782,500	97,622,752	92,967,200	34,266,416	35,279,931	32,676,185
Wheat meal and flour	14,722,893	11,954,763	14,190,300	7,258,600	6,044,845	6,817,213
Barley	27,152,300	21,426,900	19,934,500	7,161,600	6,017,350	5,677,587
Oats	14,097,700	17,095,463	15,286,500	3,726,120	4,713,265	4,532,160
Peas	2,179,506	2,015,876	1,453,420	767,097	725,104	614,649
Beans	1,862,686	1,225,050	634,280	577,094	414,227	231,758
Maize	42,897,880	42,101,210	46,685,200	10,247,134	11,034,748	11,972,686
Oatmeal and groats	648,770	633,199	661,809	456,593	463,293	495,980
Maize meal	316,660	459,188	616,200	100,940	144,829	195,302
Other kinds of corn and meal	1,660,434	1,712,434	1,746,352	513,894	581,457	609,560

TABLE XII.—*Number of* **Live Stock (Horses, Cattle, Sheep, *and* Pigs) Imported** *into Great Britain* **from Ireland** *and* **Exported** *from Great Britain* **to Ireland** *in each of the Three Years*, 1903 *to* 1905.

Live Stock	Imports from Ireland			Exports to Ireland		
	1903	1904	1905	1903	1904	1905
	No.	No.	No.	No.	No.	No.
HORSES—Stallions	265	235	202	257	182	179
Mares	12,867	12,909	14,192	3,953	3,248	2,832
Geldings	14,587	14,356	16,329	4,368	3,284	2,996
TOTAL	27,719	27,500	30,723	8,578	6,714	6,007
CATTLE—Oxen, Bulls and Cows: Fat	246,887	232,186	224,943	15	—	—
Store	556,506	470,361	455,667	612	608	584
Others	6,724	6,896	6,205	—	—	—
Calves	87,528	62,920	62,316	39	31	47
TOTAL	897,645	772,363	749,131	666	639	631
SHEEP—Sheep	444,762	372,159	350,953	31,790	29,681	34,101
Lambs	380,917	367,107	349,673	12,742	8,608	8,722
TOTAL	825,679	739,266	700,626	44,532	38,289	42,823
PIGS—Fat	541,601	478,922	362,791	1	5	9
Store	28,319	26,158	1,032	22	19	14
TOTAL	569,920	505,080	363,823	23	24	23

TABLE XIII.—*Value of* **Agricultural Machinery** *and* **Implements** *Exported from the United Kingdom in each of the Five Years* 1901 *to* 1905. [*From Annual Statement of Trade*, 1905.]

Agricultural	1901	1902	1903	1904	1905
STEAM ENGINES:	£	£	£	£	£
To British possessions	58,754	72,019	144,703	120,160	77,129
,, Foreign countries	562,214	559,717	731,398	810,488	1,021,525
Total	620,968	631,736	876,101	930,648	1,098,654
MACHINERY NOT STEAM:					
To British possessions	88,517	113,161	159,201	151,044	86,560
,, Foreign countries	644,431	698,840	820,063	930,612	960,408
Total	732,948	812,001	979,264	1,081,656	1,046,968
IMPLEMENTS AND TOOLS:					
To British possessions	156,460	189,724	210,093	168,535	165,606
,, Foreign countries	237,317	235,421	256,015	258,972	261,588
Total	393,777	425,145	466,108	427,507	427,194
Total of agricultural machinery and implements	1,747,693	1,868,882	2,321,473	2,439,811	2,572,816

TABLE XIV.—*Quantities of* **Wheat,** *and of* **Wheat Meal** *and* **Flour,** *Imported into the United Kingdom in each of the Four Years,* 1903 *to* 1906 ; *also the Countries from which they were obtained.* [*From Annual Statement of Trade,* 1905, *and Trade and Navigation Accounts,* 1906.]

——	1903	1904	1905	1906
WHEAT *from*—	Cwt.	Cwt.	Cwt.	Cwt.
Russia . . .	17,176,300	23,529,500	24,703,200	15,017,500
Germany . .	310,176	251,000	300,000	71,800
Turkey . . .	433,004	431,200	244,800	242,100
Roumania . .	3,140,727	1,491,800	2,082,200	3,780,900
United States. .	24,197,895	7,051,600	6,634,700	22,490,900
Chile . . .	238,644	915,400	162,800	800
Argentina . .	14,120,454	21,440,400	23,236,400	19,176,500
Brit. E. Indies .	17,057,857	25,493,000	22,807,422	12,636,200
Australasia . .	230	10,630,700	10,404,600	7,864,500
Canada . . .	10,802,127	6,195,300	6,522,030	11,309,700
Other countries .	653,616	352,600	524,600	376,300
TOTAL WHEAT .	88,131,030	97,782,500	97,622,752	92,967,200
WHEAT MEAL AND FLOUR *from*—	Cwt.	Cwt.	Cwt.	Cwt.
Germany . .	37,020	264,740	479,300	190,600
France . . .	577,498	1,486,920	1,034,503	560,500
Austria-Hungary .	817,879	733,294	622,885	627,630
United States. .	16,223,639	8,252,602	5,685,418	9,809,870
Canada . . .	2,637,617	2,045,767	1,330,100	1,810,500
Other countries .	307,795	1,939,570	2,802,557	1,191,200
TOTAL WHEAT MEAL AND FLOUR .	20,601,448	14,722,893	11,954,763	14,190,300

TABLE XV.—*Quantities and Values of* **Fruit, Vegetables,** *and* **Hops** *Imported into the United Kingdom in the Years* 1904, 1905, *and* 1906. [*From Annual Statement of Trade,* 1905, *and Trade and Navigation Accounts,* 1906.]

——	Quantity			Value		
	1904	1905	1906	1904	1905	1906
	Cwt.	Cwt.	Cwt.	£	£	£
Apples . . .	3,771,781	3,494,660	2,808,732	2,118,294	2,065,193	1,753,577
Strawberries. .	34,524	29,399	52,251	49,536	40,120	64,799
Cherries . .	260,724	186,682	190,874	319,824	253,042	246,383
Plums . . .	493,707	480,211	891,513	526,438	524,673	759,082
Pears . . .	535,614	417,919	576,220	503,573	407,817	571,722
Grapes . . .	853,572	700,050	690,371	827,634	761,632	667,969
Oranges . .	5,853,254	5,068,526	5,231,264	2,193,146	1,949,496	2,183,963
Lemons . .	989,296	837,028	849,935	408,500	419,049	440,406
Unenum'd (raw) .	654,765	502,097	504,345	372,575	354,143	388,598
	Bushels	Bushels	Bushels			
Onions . . .	8,292,136	7,587,025	8,310,534	1,076,472	1,094,802	953,615
	Cwt.	Cwt.	Cwt.			
Potatoes . .	9,993,965	3,664,290	3,816,373	2,437,971	1,404,607	1,332,027
Tomatoes . .	1,134,721	1,137,193	1,124,472	1,007,274	970,579	953,191
Vegetables, raw, unenumerated .	—	—	—	457,491	419,752	404,870
Hops . . .	313,667	108,953	232,619	1,839,854	456,280	852,476

TABLE XVI.—*Number and Value of Live* **Horses, Cattle, Sheep,** *and* **Swine** *Imported into the United Kingdom in the Years* 1903, 1904, *and* 1905.

[*From Annual Statement of Trade*, 1905, *and Agricultural Returns*, 1905.]

Imported from	Number			Value		
	1903	1904	1905	1903	1904	1905
HORSES:				£	£	£
Canada	421	401	296	14,631	16,541	15,055
Denmark	3,011	2,183	1,181	89,288	65,403	32,608
France	1,215	1,239	1,233	131,712	98,190	93,167
Germany	508	3,665	2,756	12,537	48,394	37,285
Holland	1,971	1,735	1,445	69,044	58,300	57,107
Russia	12,801	2,811	2,535	134,554	29,399	27,599
United States	3,160	2,368	1,135	119,951	98,692	48,266
Other countries	4,179	4,089	3,130	59,538	42,909	42,943
TOTAL	27,266	18,491	13,711	631,255	457,828	354,030
CATTLE:						
Channel Islands	1,721	1,684	1,515	31,035	28,921	25,517
Canada	190,812	146,598	148,718	3,315,762	2,547,451	2,491,150
United States	301,747	401,245	414,906	5,399,210	7,160,049	7,149,139
Argentina	27,807	—	—	455,535	—	—
TOTAL	522,087	549,527	565,139	9,201,542	9,736,421	9,665,806
SHEEP & LAMBS:						
Canada	83,291	77,835	28,240	129,045	124,799	45,580
United States	171,386	294,804	150,095	264,416	456,630	226,628
Argentina	82,941	—	—	134,239	—	—
Iceland and Greenland	16,623	9,601	4,749	18,363	10,555	6,545
TOTAL	354,241	382,240	183,084	546,063	591,984	278,753
PIGS:						
Canada	—	—	150	—	—	300
TOTAL VALUE OF LIVING ANIMALS FOR FOOD	—	—	—	9,747,605	10,328,405	9,944,859

TABLE XVII.—*Number and Value of Live* **Horses, Cattle, Sheep,** *and* **Swine** *Exported from the United Kingdom in the Years* 1903, 1904, *and* 1905.

[*From Annual Statement of Trade*, 1905.]

Exported to	Number			Value		
	1903	1904	1905	1903	1904	1905
HORSES:				£	£	£
Canada . .	370	545	707	34,065	41,878	54,716
United States .	702	504	878	87,444	50,696	58,222
Belgium . .	19,332	19,898	23,947	240,091	180,045	230,322
France . . .	2,490	2,779	3,050	140,415	114,692	154,431
Germany . .	754	632	1,337	32,129	22,939	51,745
Holland . .	9,741	7,433	16,359	83,854	66,501	204,673
Russia . . .	44	28	5	4,280	2,810	400
Other countries .	1,365	1,136	1,425	112,320	101,778	121,138
TOTAL .	34,798	32,955	47,708	734,598	581,339	875,647
CATTLE:						
Channel Islands .	160	881	1,384	2,396	12,786	19,459
Canada . .	237	77	72	7,901	2,629	2,021
United States .	193	125	149	6,082	4,200	4,062
Argentina . .	795	1,459	1,388	73,705	93,079	109,734
Other countries .	1,351	769	945	50,160	33,516	55,130
TOTAL .	2,736	3,311	3,938	140,244	146,210	190,406
SHEEP AND LAMBS:						
Australasia . .	190	276	267	2,292	4,195	4,192
Canada . .	117	359	343	390	2,940	1,504
United States .	142	328	514	1,134	1,872	2,693
Argentina . .	2,465	3,135	5,208	43,219	60,361	97,385
Germany . .	507	543	659	4,754	4,994	6,191
Other countries .	2,158	3,501	1,387	15,969	14,059	21,448
TOTAL .	5,579	8,142	8,378	67,758	88,421	133,413
PIGS:						
British possessions . . .	256	298	195	2,495	4,030	1,488
Foreign countries	520	434	736	4,558	3,820	6,536
TOTAL .	776	732	931	7,053	7,850	8,024

TABLE XVIII.—*Quantities and Values of* Dead Meat *Imported into the United Kingdom in the Three Years*, 1904 *to* 1906.

[*From Trade and Navigation Accounts.*]

Dead Meat	1904		1905		1906	
	Quantities	Values	Quantities	Values	Quantities	Values
	Cwt.	£	Cwt.	£	Cwt.	£
BACON:						
From United States	2,806,108	6,209,009	2,755,233	5,828,392	2,775,919	6,859,061
„ Denmark	1,723,884	4,532,420	1,471,687	3,978,317	1,463,880	4,324,055
„ Canada	829,883	1,865,159	1,191,390	2,751,714	1,190,524	3,135,391
„ Other countries	92,436	225,554	80,650	216,432	112,299	325,588
Total	5,452,311	12,832,142	5,498,960	12,774,855	5,542,622	14,644,095
BEEF:						
Salted. From United States	135,280	173,098	135,277	191,115	146,163	197,238
„ Other countries	9,024	14,190	7,529	11,192	15,200	20,709
Total	144,304	187,288	142,806	202,307	161,363	217,947
Fresh. From United States	2,395,836	5,130,286	2,232,206	4,834,611	2,426,644	5,235,663
„ Argentina	1,675,271	2,482,704	2,580,152	3,751,780	2,795,913	4,136,819
„ Australasia	251,357	386,825	164,363	239,740	275,303	374,192
„ Other countries	27,567	58,526	60,800	105,462	31,269	46,996
Total	4,350,031	8,058,341	5,037,521	8,931,593	5,529,129	9,793,670
HAMS:						
From United States	1,042,659	2,606,129	1,022,855	2,409,993	1,045,718	2,808,823
„ Canada	196,732	485,527	292,173	698,463	254,494	674,469
„ Other countries	4,612	13,343	3,274	9,916	2,539	8,302
Total	1,244,003	3,104,999	1,318,302	3,118,372	1,302,751	3,491,594
MEAT (unenumerated):						
Salted or fresh. From Holland	265,395	584,725	253,103	573,338	222,280	502,027
„ United States	132,539	210,624	166,088	255,921	189,328	282,128
„ Other countries	233,078	369,093	250,953	396,433	240,755	361,311
Total	631,012	1,164,442	670,144	1,225,692	652,363	1,145,466
Preserved, otherwise than by salting. Beef	556,918	1,611,693	598,030	1,789,399	296,301	1,103,695
Mutton	35,877	85,458	30,111	77,112	48,443	125,954
Other sorts	220,223	761,440	204,888	780,684	142,678	593,022
Total	813,018	2,458,591	833,029	2,647,195	487,422	1,822,671
MUTTON:						
Fresh. From Australasia	1,789,907	3,715,264	2,030,394	4,152,761	2,365,058	4,566,254
„ Argentina	1,422,397	2,491,210	1,462,537	2,458,915	1,433,097	2,440,996
„ Holland	265,702	605,225	235,172	539,672	234,926	536,100
„ Other countries	16,776	49,832	82,966	185,142	55,608	112,193
Total	3,494,782	6,861,531	3,811,069	7,336,490	4,088,689	7,655,543
PORK:						
Salted (not hams). From United States	76,977	119,423	72,528	111,082	67,775	116,480
„ Other countries	166,865	174,657	133,437	141,524	138,281	150,320
Total	243,842	294,080	205,965	252,606	206,056	266,800
Fresh. From Holland	448,154	1,005,450	306,379	713,523	318,296	739,588
„ Belgium	32,798	83,061	39,344	97,439	13,225	32,744
„ United States	119,259	262,450	135,233	292,390	120,734	268,804
„ Other countries	10,274	27,506	24,677	59,018	39,916	89,814
Total	610,485	1,378,467	505,633	1,162,370	492,171	1,130,950
RABBITS:						
From Australasia	429,980	479,509	562,986	568,431	717,981	761,172
„ Belgium	77,407	224,791	69,624	199,777	66,811	185,207
„ Other countries	26,311	76,437	23,468	67,721	18,764	54,407
Total	533,698	780,737	656,078	835,929	803,556	1,000,786
TOTAL OF DEAD MEAT	17,517,486	37,120,618	18,679,507	38,487,409	19,266,122	41,169,522

TABLE XIX.—*Quantities and Values of* **Butter, Margarine, Cheese, Milk, Poultry,** *and* **Eggs** *Imported into the United Kingdom in each of the Years* 1904, 1905, *and* 1906; *also the Countries from which they were obtained.* [*From Trade and Navigation Accounts.*]

	Quantities			Values		
	1904	1905	1906	1904	1905	1906
BUTTER:	Cwt.	Cwt.	Cwt.	£	£	£
From Russia	404,717	461,140	606,549	1,817,736	2,246,503	2,918,124
,, Sweden	206,791	188,209	182,803	1,062,353	1,021,603	1,036,638
,, Denmark	1,708,619	1,630,363	1,675,761	9,003,089	8,919,766	9,636,862
,, Germany	4,080	5,372	10,701	20,547	27,169	56,559
,, Holland	252,262	209.897	195,366	1,225,768	1,047,690	993,396
,, France	371,061	348,442	319,401	1,961,094	1,860,545	1,775,601
,, New South Wales	159,622	168,531	180,655	747,876	848,022	957,702
,, Queensland.	59,475	54,188	77,982	270,231	269,077	404,980
,, Victoria	255,716	227,574	287,190	1,212,660	1,144,141	1,568,057
,, New Zealand	294,982	300,418	311,672	1,394,455	1,467,628	1,626,997
,, Canada	268,607	292,117	192,093	1,194,823	1,428,494	982,064
,, United States	68,754	84,874	157,312	294,584	401,916	748,197
,, Other countries	186,319	176,741	140,898	911,946	904,068	761,075
Total	4,241,005	4,147,866	4,338,383	21,117,162	21,586,622	23,466,252
MARGARINE:						
From Norway	5,667	6,731	5,291	14,081	16,153	12,504
,, Holland	927,980	1,051,630	1,058,623	2,390,243	2,617,743	2,601,344
,, France	23,580	27,324	29,422	82,305	95,259	102,500
,, Other countries	3,051	2,574	8,626	7,838	6,581	17,447
Total	960,278	1,088,259	1,101,962	2,494,467	2,735,736	2,733,795
CHEESE:						
From Holland	233,601	214,033	229,343	542,530	498,994	545,947
,, France	44,268	48,884	43,244	138,289	158,224	140,702
,, New Zealand	84,947	78,626	126,216	217,286	203,344	370,666
,, Canada	1,900,556	1,858,767	1,925,835	4,234,790	4,804,172	5,634,288
,, United States	224,830	175,256	233,425	503,312	445,003	656,705
,, Other countries	66,095	67,116	80,713	207,563	230,074	259,333
Total	2,554,297	2,442,682	2,638,776	5,843,770	6,339,811	7,607,641
CONDENSED MILK:	904,136	893,634	908,019	1,608,391	1,584,363	1,563,708
MILK AND CREAM: (other than Condensed)	12,911	8,542	12,279	29,437	23,819	24,040
POULTRY (and game):						
From Russia	—	—	—	379,174	291,917	206,260
,, Belgium	—	—	—	263,078	199,115	198,421
,, France	—	—	—	236,166	228,001	204,402
,, Other countries	—	—	—	338,859	280,447	376,374
Total	—	—	—	1,217,277	999,480	985,457
EGGS:	Great Hundreds	Great Hundreds	Great Hundreds			
From Russia	7,032,906	7,622,393	7,132,928	2,042,520	2,426,029	2,344,256
,, Denmark	3,602,326	3,858,135	3,823,942	1,461,459	1,634,288	1,701,291
,, Germany	3,554.232	2,175,721	2,644,242	1,191,161	764,966	957,905
,, Belgium	2,517,073	2,152,953	2,444,746	837,120	830,598	992,103
,, France	1,698,614	1,565,572	1,491,269	710,057	660,369	623,119
,, Canada	317,722	260,140	231,719	129,631	114,557	106,393
,, Other countries	1,219,721	1,179,379	1,105,263	358,626	381,629	373,070
Total	19,942,594	18,814,293	18,874,109	6,730,574	6,812,436	7,098,137

TABLE XX.—*Quantities and Values of* **Wool, Wood, Seeds, Manures, &c.,** *Imported into the United Kingdom in the Years* 1904, 1905, *and* 1906. [*Trade and Navigation Accounts.*]

	Quantities			Values		
	1904	1905	1906	1904	1905	1906
WOOL: Sheep and Lambs'	Lb. 561,677,833	Lb. 615,708,827	Lb. 639,553,059	£ 20,366,030	£ 23,821,825	£ 27,154,486
WOOD AND TIMBER:	Loads	Loads	Loads			
Hewn	3,107,432	2,856,551	3,247,786	5,559,289	5,473,805	6,413,713
Sawn or split, planed or dressed	6,066,236	5,986,526	6,692,260	15,505,799	15,255,330	18,533,958
Staves	132,176	119,182	139,041	527,696	553,092	632,568
SEEDS:	Cwt.	Cwt.	Cwt.			
Clover & grass	426,475	316,043	300,939	869,838	651,576	615,920
	Tons	Tons	Tons			
Cotton	468,653	568,928	624,767	2,537,499	2,973,520	3,716,567
	Qrs.	Qrs.	Qrs.			
Flax or linseed	2,785,983	1,924,008	1,588,100	4,502,064	3,541,333	3,274,988
Rape	309,325	181,326	118,149	386,420	286,073	234,639
MANURES:						
Bones (burnt or not)	Tons 35,103	Tons 47,346	Tons 42,607	153,373	209,913	194,638
Guano	24,276	29,223	24,906	117,753	138,906	127,719
Nitrate of soda	120,526	104,436	108,486	1,176,208	1,104,587	1,183,082
Phosphate of lime and rock	419,270	420,988	442,970	620,066	616,131	678,684
MISCELLANEOUS:	Tons	Tons	Tons			
Hay	131,234	116,913	—[1]	437,764	382,567	—[1]
Straw	115,881	102,254	—[1]	254,987	228,928	—[1]
Flax	74,917	90,098	87,365	3,185,475	3,581,808	3,558,567
Hemp	132,425	121,722	117,325	4,121,755	3,755,587	3,712,167
	Lb.	Lb.	Lb.			
Linen yarn	23,567,204	21,787,642	26,311,329	840,321	768,689	933,426
Hides, raw:	Cwt.	Cwt.	Cwt.			
Dry	325,268	351,762	484,191	940,604	1,078,014	1,603,601
Wet	449,580	508,467	533,321	1,106,360	1,322,874	1,493,009
Leather	1,151,405	1,137,895	1,291,883	8,036,907	8,086,235	9,642,492
	Gallons	Gallons	Gallons			
Petroleum	302,131,143	300,110,335	299,251,714	5,839,033	5,423,124	5,853,409
	Cwt.	Cwt.	Cwt.			
Lard	1,830,837	2,012,305	2,049,367	3,342,389	3,692,573	4,361,399
	Tons	Tons	Tons			
Oil-seed Cake	371,809	357,580	360,188	2,128,817	2,206,165	2,362,471

[1] Figures not yet available.

[Continued from page 317.]
one year and above, other than ewes, a small increase in Wales was rather more than set off by a decrease in England, while a more serious decline of 47,000 appeared in Scotland. The rise in the price of wool which, during the past two or three years, has gladdened the hearts of flockmasters, is perhaps mainly accountable for the increase of sheep which has taken place since 1904; indeed, it is a matter of some surprise that its effect has not been larger. Taking the number of ewes kept for breeding as the criterion, it is noticeable that the addition in two years to the ewe flock of Great Britain, notwithstanding the improvement in the wool trade, has not exceeded 180,000, an increase which has more than once been exceeded in a single year when no such unusual influence was operating. Thus, in 1896, 260,000, and in 1899 no fewer than 320,000, were added in one season.

Pigs.—Sows kept for breeding exhibited only casual variations, resulting, on balance, in a slight increase of 1,314 in Great Britain. In other pigs there was a decline of 102,772, or 4·9 per cent., as compared with last year. Practically the whole of the net reduction occurred in England, where only four counties materially increased their stock of pigs, the largest addition being that of Chester, 2,834. On the other hand, four eastern counties alone, viz., Essex, Lincoln, Norfolk, and Suffolk, lost in the aggregate nearly 38,000 head of swine since the previous enumeration. The present decrease of 101,458 pigs in Great Britain, following on the reduction recorded last year, brought the total half a million below 1904, but it may be added that even with this considerable reduction, the number of pigs was still higher than it was as recently as 1902.

Mr. Rew, in his report, thus sums up the gains and losses of stock owners in the year ended June 4, 1906 :—

GAINS	No.	LOSSES	No.
HORSES :—		HORSES :—	
Unbroken horses, one year and above	4,902	Horses used for agricultural purposes and mares for breeding purposes	5,914
CATTLE :—		Unbroken horses under one year	2,740
Cows and heifers in-milk or in-calf	31,019	CATTLE :—	
Other cattle. Two years and above	11,437	Cattle under one year	42,345
Other cattle. One year and under two	23,725	SHEEP :—	
SHEEP :—		Sheep (other than ewes) one year and above	48,641
Ewes kept for breeding	125,338	PIGS :—	
Sheep under one year	86,467	Pigs other than breeding sows	102,772
PIGS :—			
Sows kept for breeding	1,314		

The balance may fairly be regarded as falling on the credit side of the account, in view especially of the fact that, in the case of cattle, sheep, and pigs, the breeding stock has been augmented, and on the whole, therefore, the results of the farm-stock census of 1906 may be deemed to be fairly satisfactory.

THE WEATHER DURING THE AGRICULTURAL YEAR, 1905–1906.

THE weather of the agricultural year 1905-1906 was, upon the whole, of an unusually favourable character.

The autumn of 1905 was cool, but it had the merit of being very dry, so that early sowing was conducted under the most advantageous circumstances, and farm and field work of all kinds proceeded with scarcely any serious interruption. The succeeding winter was changeable, but the excess of rain was nowhere very great, and the brief spells of sharp frost which occurred from time to time served to check the progress of growth, which would otherwise have been dangerously rapid. The spring was mostly cool but fairly dry, and although the frosts in the latter part of the season played much havoc with the fruit blossoms and with some of the low-lying crops, the weather gave, in other respects, little cause for complaint. The summer was characterised by an abundance of fine dry weather, interspersed at times, however, with heavy thunder rains, and in some localities with wind and hailstorms of quite a torrential character. In spite of these drawbacks the season was, upon the whole, a good one, and in most parts of the country a bountiful harvest was gathered under the most favourable conditions. The autumn record of 1906 was also meteorologically a success, so that the agricultural season of 1906-1907 started, like its predecessor, with good omens for the future.

THE WINTER OF 1905-1906.

The winter of 1905-1906 was for the most part mild, but very changeable, the frequent veering and backing of the wind between south-west and north-west being accompanied by large fluctuations in temperature. A drought of unusual duration for the time of year occurred in the middle portion of December, but this was succeeded by heavy rains in the earlier half of January, the precipitation of February being of a more variable nature. The sharpest frosts occurred, as in so many recent winters, towards the end of the season, but were less severe than in many previous years.

December opened with a spell of south-westerly winds (strong to a gale in force between the 5th and 8th), the weather being dry and fairly mild, with, however, slight frost in many localities on the 3rd and 4th. After the 9th the wind became light, but remained in the west, so that the temperature was still above its average level, excepting in the midland and southern districts, where sharp night frosts occurred between the 10th and 13th with a good deal of fog.

Mild dry weather continued throughout the latter half of the month, the wind being usually light from south-west or west, but calm for a few days after Christmas, when fog reappeared in many parts of England.

At the close of December a cyclonic disturbance spread over these islands from the Atlantic and occasioned very strong winds from south-east, with heavy rain in all the southern districts. Later on the bad weather became more general, the wind being, as a rule, rather variable, but blowing with the force of a gale from the westward in the south on January 6. Between the 9th and 17th a strong breeze from the south-westward prevailed, with mild unsettled weather, heavy rain being experienced in the south-western district on the 12th, in Hampshire on the 16th, and at many western stations on the 17th. Thunderstorms occurred in the south on the 9th or 10th, and in some parts of North Wales and the north-west of England on the 13th, while snow was experienced on the 16th or 17th at many places in the north. After January 18 the wind got round to the north, and the weather became temporarily much colder, with sharp night frosts, and with snow showers in the north and east. In the closing week of January the wind returned to the westward, and the thermometer rose decidedly, the weather being much drier than in the earlier part of the month.

February was, upon the whole, cold and changeable, with frequent showers of snow or sleet in nearly all parts of the kingdom. For the first few days the wind was in the north, and on the night of the 5th a very sharp frost was experienced over central England, the exposed thermometer falling to a minimum of 15° at Rauceby, and 17° at Oxford. During the remainder of the month the direction of the wind varied greatly, the only important exception occurring between the 8th and 11th, when gales from between south-west and north-west were experienced over a large portion of the country. On the 8th a sharp thunderstorm travelled quickly from north-west to south-east across England, with squalls of hail or snow in many places. Heavy rain occurred in Cornwall and Devonshire on the 22nd, and between this date and the 24th a sharp frost was experienced very generally, the temperatures recorded being in many places the lowest of the whole winter.

For the season, as a whole, the mean temperature was above the average, the excess being slight in the south-west, but rather large over the midland, eastern, and north-eastern counties. In the midlands and in the Channel Islands, the total rainfall of the winter agreed very closely with the normal, and in the north-eastern district there was a deficiency, amounting to as much as 21 per cent. Other districts recorded

an excess, amounting to 15 per cent. in the southern counties, 18 per cent. in the eastern counties, and 21 per cent. in the south-western district. The amount of bright sunshine was in excess of the average in all districts, the winter being, as a whole, one of the brightest of recent years.

The Spring of 1906.

The spring was characterised by changeable weather, but was for the most part dry and rather cool, with frequent showers of snow or sleet in the latter half of March. An unusually brilliant April was followed by a dull and cheerless May, the duration of bright sunshine in the one month being almost as exceptional as in the other, though in an entirely opposite direction. In the third week in May, many parts of the country experienced sharp ground frosts, which occasioned locally a considerable amount of damage to the fruit blossoms, and to the tenderer kinds of field and garden crops.

March opened with a few days of brilliantly fine weather in the eastern and southern counties, but with less settled conditions in the west and north, a strong westerly wind on the 8th and 9th being accompanied by thunderstorms in some parts of the north-western district. After the close of the first week the weather fell into a very unsettled state generally, and on the 11th and 12th a gale from south, veering to west and north-west, was experienced over the whole country with squalls of sleet or snow. Along our east coasts the north-westerly gale of the 12th was accompanied by an exceedingly high tide, which caused serious flooding in places. For the remainder of March the weather was generally cold and changeable, the only important exception occurring about the 17th, when the spreading in of a mild breeze from the south-westward resulted in a shade temperature as high as 65° in many parts of England. At other times the wind was almost always from some northerly point, with occasional showers of hail, sleet, or snow. Sharp night frosts were common, the keenest of all occurring on or about the 13th, when the sheltered thermometer fell slightly below 20° in many places. In some parts of our northern and midland counties equally low temperatures were recorded between the 28th and 29th, but at this time the weather was improving, and at the close of the month it became fine and dry in nearly all districts.

April was for the most part fine, dry, and unusually sunny. Between the 9th and 12th the thermometer was high for the season, maximum readings of 70° and upwards being recorded in most districts. In the closing week a rather unpleasant change took place, the wind, which had hitherto been rather variable, settling down into a northerly quarter and the weather

[Continued on page 338.]

Rainfall, Temperature, *and* Bright Sunshine *experienced over* England *and* Wales *during the whole of* 1906, *with Average and Extreme Values for Previous Years.*

Districts	Rainfall							
	Total Fall				No. of Days with Rain			
	In 1906	For 40 years, 1866-1905			In 1906	For 25 years, 1881-1905		
		Average	Extremes			Average	Extremes	
			Driest	Wettest			Driest	Wettest
	In.	In.	In.	In.				
North-eastern	24·6	25·6	19·9 (1884)	37·2 (1872)	188	185	162 (1884)	208 (1894)
Eastern	24·2	24·9	19·1 (1874 and 1887)	33·1 (1872)	165	180	156 (1898)	205 (1894)
Midland	25·3	27·6	19·2 (1887)	39·8 (1872)	183	178	148 (1887)	210 (1882)
Southern	27·8	28·5	21·5 (1887)	41·7 (1872)	177	172	137 (1899)	197 (1882 and 1903)
North-western with North Wales	37·1	37·8	24·9 (1887)	59·2 (1872)	208	198	163 (1887)	226 (1903)
South-western with South Wales	40·6	41·9	28·3 (1887)	68·6 (1872)	203	198	159 (1887)	235 (1882)
Channel Islands[1]	29·6	33·0	26·2 (1887)	39·5 (1882)	199	213	169 (1899)	251 (1886)

Districts	Mean Temperature				Hours of Bright Sunshine			
	In 1906	For 40 years, 1866-1905			In 1906	For 25 years, 1881-1905		
		Average	Extremes			Average	Extremes	
			Coldest	Warmest			Cloudiest	Sunniest
	°	°	°	°				
North-eastern	48·7	47·4	45·0 (1879)	49·2 (1898)	1601	1310	1006 (1885)	1558 (1893)
Eastern	49·9	48·5	45·8 (1879)	51·0 (1868)	1811	1579	1267 (1888)	1864 (1899)
Midland	49·2	48·3	45·8 (1879)	51·1 (1868)	1557	1402	1173 (1888)	1715 (1893)
Southern	50·2	49·6	46·9 (1879)	51·6 (1898)	1863	1595	1245 (1888)	1983 (1899)
North-western with North Wales	48·8	48·5	45·9 (1879)	50·3 (1868 and 1893)	1516	1396	1198 (1888)	1683 (1901)
South-western with South Wales	49·7	50·2	48·3 (1888)	52·8 (1868)	1714	1650	1459 (1888)	1964 (1893)
Channel Islands[1]	52·5	52·2	50·7 (1885)	54·3 (1899)	1944	1899	1710 (1888)	2300 (1893)

NOTE.—The above Table is compiled from information given in the Weekly Weather Report of the Meteorological Office.

[1] For the Channel Islands the "Averages" and "Extremes" of Rainfall and Mean Temperature are for the twenty-five years, 1881-1905.

The Rainfall of 1906 *and of the previous Ten Years, with the Average Annual Fall for a long period, as observed at thirty-eight stations situated in various parts of the United Kingdom.*

Stations	1906		Rainfall of Previous Years										[1] Average rainfall
	Total rainfall	Difference from average.	1905	1904	1903	1902	1901	1900	1899	1898	1897	1896	
ENGLAND AND WALES:	In.	Per cent.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.	In.
Durham	23·8	—14	19·2	19·0	30·8	18·5	22·9	28·8	24·5	20·8	21·8	24·5	27·6
York	22·8	—11	20·7	20·8	30·3	18·7	20·5	25·8	22·4	23·7	24·4	22·2	25·6
Hillington	31·6	+16	22·7	25·7	35·6	26·2	24·4	32·6	24·7	22·1	26·3	29·7	27·3
Yarmouth	28·0	+ 6	22·6	21·0	25·1	21·4	21·2	24·7	22·4	20·0	20·8	21·3	26·4
Cambridge	22·4	— 2	19·0	17·6	30·5	15·8	16·7	19·7	19·3	17·9	20·4	20·7	22·8
Rothamsted	26·8	— 5	24·8	23·2	36·3	19·6	21·1	27·1	25·1	18·7	25·0	29·0	28·1
Nottingham	21·8	—14	18·6	20·0	32·2	21·5	20·4	28·5	22·6	19·5	23·4	23·0	25·3
Cheadle	34·3	+ 2	26·7	26·3	39·2	26·4	27·7	37·5	30·9	27·8	32·8	29·3	33·6
Hereford	23·6	—12	24·0	25·0	37·8	24·3	25·2	32·8	26·7	22·4	26·7	18·2	26·9
Cirencester	26·2	—16	25·1	28·8	41·1	25·1	26·1	31·0	26·8	22·1	32·7	23·6	31·2
Oxford	24·0	— 5	21·0	22·7	35·9	16·7	22·3	23·6	21·0	19·1	26·3	23·5	25·3
London	22·2	— 9	23·0	20·2	38·0	20·4	21·5	22·2	22·0	17·8	23·3	22·7	24·4
Hastings	28·7	— 2	26·9	24·6	32·3	23·0	19·4	29·8	25·8	23·0	28·1	29·9	29·2
Southampton	33·1	+ 7	26·2	31·0	43·2	27·4	28·3	31·6	27·6	26·6	32·6	26·3	30·9
Stonyhurst	49·7	+ 4	38·8	39·6	58·9	36·8	39·0	48·3	47·5	47·9	51·3	44·2	47·9
Manchester	42·2	+12	33·3	32·0	45·2	26·5	33·3	42·8	33·5	33·2	39·1	38·4	37·8
Liverpool	28·1	— 2	24·0	25·1	34·4	25·6	25·1	31·9	27·6	25·6	28·4	26·6	28·8
Llandudno	31·6	+ 1	26·1	26·0	38·5	25·0	28·7	32·8	32·4	31·3	30·7	30·4	31·2
Pembroke	42·5	+20	28·2	31·8	45·8	30·9	33·0	40·6	35·0	35·5	38·1	30·7	35·3
Clifton	30·1	—14	25·0	30·9	42·8	26·5	26·6	37·7	35·5	30·9	38·9	27·6	35·1
Cullompton	33·9	— 5	28·1	34·9	42·7	30·8	31·1	35·5	37·0	29·9	38·9	27·6	35·5
Plymouth	33·4	— 8	30·5	41·4	45·8	30·9	33·0	40·3	33·1	29·2	40·4	29·1	36·3
Scilly (St. Mary's)	29·8	—11	27·5	34·4	39·9	25·3	32·6	34·1	31·9	27·1	35·7	25·8	33·6
Jersey (St. Aubin's)	29·2	—14	30·3	37·3	38·2	30·4	29·6	34·6	26·3	30·0	36·2	33·2	33·9
[2] Mean for the whole of England and Wales	29·9	— 5	25·6	28·0	37·5	26·7	27·4	32·3	28·6	26·2	31·3	28·5	31·6
SCOTLAND:													
Stornoway	42·2	— 9	50·7	55·7	62·1	46·3	42·8	62·5	59·9	71·6	45·2	59·0	46·6
Wick	33·2	+16	32·3	25·3	35·9	26·4	32·1	33·1	29·7	27·4	21·9	34·7	28·6
Aberdeen	31·5	+ 2	28·5	23·7	36·3	27·3	28·0	34·0	30·3	27·5	28·7	31·2	30·8
Balmoral [3]	39·1	+ 9	35·6	24·9	44·1	31·8	31·4	40·5	35·6	36·5	36·8	30·2	36·0
Leith	30·2	+29	19·2	23·4	30·9	16·4	22·5	31·2	24·8	19·9	20·5	21·7	23·4
Marchmont	38·9	+13	27·4	26·1	38·6	24·4	27·2	43·8	32·6	28·3	29·0	31·4	34·5
Fort Augustus	51·6	+21	43·6	44·4	66·0	35·6	36·9	50·5	42·3	54·3	41·9	42·6	42·5
Glasgow	40·1	+ 1	30·7	33·7	53·3	29·1	32·9	47·0	43·5	37·4	39·7	35·9	39·8
[2] Mean for the whole of Scotland	46·3	+ 5	41·4	42·1	57·1	43·0	40·8	52·2	46·1	47·4	41·5	43·7	44·3
IRELAND:													
Edenfel (Omagh)	42·4	+12	36·1	42·9	54·9	39·3	43·0	46·7	42·0	40·4	46·3	37·3	37·8
Markree Castle	44·6	+ 7	39·0	44·9	54·1	38·4	44·9	45·3	43·7	40·4	46·1	42·3	41·6
Armagh	30·1	— 4	29·9	30·9	36·3	31·7	32·1	36·4	32·5	31·8	35·1	31·2	31·5
Dublin	22·8	—18	25·3	22·2	31·6	29·4	26·1	34·3	27·7	27·1	29·4	26·9	27·8
Parsonstown	32·6	— 1	25·7	32·9	40·8	28·2	31·1	38·5	33·1	34·2	37·8	32·4	33·0
Kilkenny	28·7	—12	25·0	31·5	42·0	33·1	30·3	39·2	30·9	29·1	41·4	29·2	32·8
[2] Mean for the whole of Ireland	36·7	— 8	34·6	38·9	47·9	37·2	37·7	44·9	40·6	38·6	44·5	38·0	39·7

[1] The Average Fall is in nearly all cases deduced from observations extending over the thirty-five years 1866–1900.

[2] The Mean Rainfall for each country is based upon observations made at a large number of stations in addition to those given above.

[3] The figures for "Previous Years" are for Braemar, which ceased reporting after 1905.

[Continued from page 335.]

becoming cold and changeable, with showers of snow or sleet, and with occasional thunderstorms in various parts of the country. The lowest temperatures occurred between the 27th and 29th, when sharp ground frosts were experienced over the more central districts.

May, which proves so often the brightest month of the year, was characterised for the most part by dull cheerless weather, with an excess of rain in all but the eastern districts. A burst of summer warmth on the 8th was accompanied by thunderstorms of considerable severity and by heavy rain along the valley of the upper Thames ; in some places as much as 2 in. were measured. Thunderstorms were also experienced in many places on the 13th, while on the 19th a cool wind blowing in from the North Sea was accompanied by a very heavy downpour of rain in the north of England, many stations in Durham and Northumberland recording amounts varying between 2 and $2\frac{1}{2}$ in. Temperature at about this time was generally low, with ground frosts of sufficient intensity to cause damage locally to the fruit and ground crops. Towards the end of the month the weather seemed to deteriorate rather than to improve, the closing week being marked by heavy rains in most districts, and by thunderstorms in the south and also in the north of England.

For the season, as a whole, the mean temperature of the spring was mostly below the average, the deficiency being greatest in the west and south. The total rainfall exceeded the normal in the western parts of the country, but was below in all the eastern, central, and southern districts. In the eastern counties, only 80 per cent. of the average was recorded, and in the midlands only 77 per cent. The duration of bright sunshine was in excess of the normal in most districts, but in the midland counties the excess was small. In the north-western counties, and in the Channel Islands, the amount agreed very closely with the average.

The Summer of 1906.

The summer proved one of the finest and driest of recent years. In the early part of the season, brilliant sunshine was tempered by cool winds, so that the thermometer seldom rose to any very high level. Later on, the weather became gradually warmer, and quite at the close of August and the beginning of September a burst of heat of quite a phenomenal character for so late in the season was experienced over the entire country. The most striking features of an untoward nature were a very heavy rainstorm, which occurred in the south and south-east between the 28th and 29th of June, and a series of thunderstorms which were developed over the

whole country at the beginning of August. On August 1 an exceedingly heavy fall occurred in Wales and the neighbouring parts of England, while on the following day a destructive whirlwind was experienced in and around Guildford, and a still more destructive hailstorm in north-east Bedfordshire and the neighbouring parts of Cambridgeshire and Huntingdonshire. In the latter case the crops over a large area, which promised an abundant yield, were beaten down and entirely destroyed, the total loss of property being estimated at about 55,000*l*.

June opened with thundery weather, but the conditions soon improved, and for about three weeks the country experienced an almost uninterrupted run of bright sunshine, the only important exception occurring between the 13th and 16th, when thunderstorms occurred in many places. With a general prevalence of winds from some northerly quarter the thermometer was usually rather low for the time of year, and between the 4th and 6th slight ground frosts were experienced in various parts of the eastern and midland counties. Towards the close of the month the weather became warmer, but less settled, and between the 28th and 29th, a heavy fall of rain occurred over southern England, the amount in the space of about twelve hours, being as large as 2·4 in. at Kew, 2·2 in. at Rothamsted, and 2·1 in. in Central London (at Westminster). Between 9.45 a.m. and 10 a.m. on the 27th, earthquake shocks of an alarming character were experienced in South Wales and the West of England, and in some localities a certain amount of structural damage was reported.

July was upon the whole fine and fairly dry, but until very nearly the close of the month the thermometer failed to rise to any very high level for the time of year. Thunderstorms were rather general over the south and east of England on the 11th and 12th, the weather being, however, at the same time very cool, with slight ground frost in some few parts of our eastern and midland counties. A near approach to ground frost was also reached in the northern and central parts of the country on the night of the 20th. In the last week of the month the weather became, as in June, warm and changeable, with thunderstorms and heavy rain over eastern, central, and southern England on the 27th. On the 30th the thermometer rose to 80° and upwards in many parts of the country.

August opened with a spell of exceedingly unsettled weather, the thunderstorms of the 1st and 2nd being attended in some parts of our midland and southern counties, as we have already seen, by violent and destructive effects. After this outburst, the conditions improved, but for the remainder of the month the weather, although much finer in the south and east than elsewhere, was never quite settled. Further thunderstorms which

occurred on the 7th and 8th were again accompanied by heavy falls of rain in some parts of our eastern counties, the amount at Rauceby, in Lincolnshire, on the latter day being as much as 1·4 in. in the space of an hour and a half (10 to 11.30 p.m.). In the latter part of the month there was a general deficiency of rain in all but the northern districts, and quite at the close the thermometer rose rapidly to an abnormally high level for so late in the season ; the shade maxima of the 31st being above 90° in many parts of the country, and as high as 95° at one or two places in the south.

For the summer as a whole the mean temperature was above the average, but owing to the coolness of the earlier half of the season the excess of warmth was not very great. Excepting in those few localities in which torrential downpours occurred the rainfall was very deficient, the driest weather being experienced in the eastern, midland, and southern districts. For the south of England as a whole the total rainfall did not amount to more than 51 per cent. of the average. Bright sunshine was abundant, especially in the drier portions of the country, where the summer was one of the finest within recent years. The amount of sunshine was, however, no larger than in 1904, and was not nearly so large as in 1899.

The Autumn of 1906.

The autumn was mostly warm, with an excess of rain over the eastern half of the country, but with a slight deficiency in the west. The tendency for fine weather, so largely prevalent in the earlier portions of the year, was still in evidence, and although the conditions in October and November were often extremely unsettled, the total duration of sunshine was again in excess of the average.

The phenomenal burst of heat experienced at the close of August continued throughout the first three days of September, when shade temperatures of 90° and upwards were recorded in nearly all parts of the country. At some places in the midland and southern counties the thermometer rose to 95°, and at Bawtry it touched 96°, the readings at the time being in nearly all cases the highest on record for the month of September, and in some cases the highest on record for any time in the year. A sudden change to cooler weather occurred on the 4th, but for nearly three weeks the temperature remained above the normal, the only touch of cold occurring on the night of the 10th, when a rather sharp ground frost occurred over the inland parts of the country. The conditions were for some little time changeable and showery, and on the 15th and 16th thunderstorms were experienced in many places. Towards the close of the month the weather became

fine and very dry, the days being warm and sunny, but the nights cold, and often foggy, with occasional sharp ground frosts.

Under the influence of numerous cyclonic disturbances, which came in from the Atlantic, the weather in October was very unsettled, with frequent, and in some cases heavy, falls of rain. Temperature was, however, more often than not above the average, and at a few places in the south-east of England the month proved the mildest October on record. Thunderstorms occurred in the north of England on the night of the 1st, and heavy rain was experienced over the midland and southern districts on the 2nd and 3rd. Thunderstorms were reported over eastern and central England on the 9th and 10th, while on the 18th and 19th, a heavy fall of rain occurred over our northern counties, between $1\frac{3}{4}$ in. and 2 in. being measured on the morning of the 19th in some parts of Northumberland. Further thunderstorms occurred in various parts of the country on the 28th, and on the two following days a considerable amount of rain was registered in many districts.

The weather of November was very variable, but temperature remained, as a rule, above the average. Heavy rain fell in the Channel Islands on the 4th, and over the eastern, midland, and southern counties on the 8th. Towards the end of the second week an anticyclone spread in from the Atlantic, and sharp night frosts occurred in most districts. A temporary change to very unsettled weather occurred after the 14th, with a low temperature and squalls of hail or sleet in many places, and on the 19th, a stiff gale from the north-westward blew very generally. This was succeeded by a very mild southerly breeze, and between the 21st and 24th, the thermometer rose to an unusually high level for so late a period in the season. In the closing week the weather remained warm, with a deficiency of rain in the eastern districts, but with an excess at many places in the west.

For the season, as a whole, the mean temperature was considerably above the normal, the excess being especially large over the eastern and midland counties. Rainfall was more than the average in all the eastern and central districts, but was slightly deficient in the western parts of the country, and largely deficient in the Channel Islands. The amount of bright sunshine showed a general excess, but in the north-east of England the departure from the normal was not large.

Frederick J. Brodie.

12 Patten Road,
Wandsworth Common.

MEMORANDA.

ADDRESS OF LETTERS.—All letters on the general business of the Society should be addressed to "The Secretary, Royal Agricultural Society of England, 16 Bedford Square, London, W.C."

TELEGRAMS.—Registered address for telegrams: "Practice, London."

TELEPHONE NUMBER.—3675, "Gerrard."

OFFICE HOURS.—10 to 4. On Saturdays, 10 to 2.

ANNUAL GENERAL MEETING, Wednesday, December 11, 1907, at the Society's house, 16 Bedford Square, London, W.C.

MONTHLY COUNCIL (for transaction of business), at noon: usually on the first Wednesday in every month, excepting January, September, and October: open only to Members of Council and Governors of the Society.

SUBSCRIPTIONS.—1. *Annual.*—The minimum subscription of a Governor is 5*l.*, and that of a Member 1*l.*, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June.

2. *For Life.*—Governors may compound for their subscriptions for future years by paying at once the sum of 50*l.*, and Members by paying 15*l.* After payment of ten or more annual subscriptions, a Member may compound for future subscriptions, including that of the current year, by a single payment of 10*l.*; and after payment of twenty or more annual subscriptions, by a single payment of 5*l.*—or 25*l.* in the case of Governors.

No Governor or Member can be allowed to enter into a composition for life until all subscriptions due by him at the time shall have been paid.

No Governor or Member whose subscription is in arrear is entitled to any of the privileges of the Society.

All Members of the Society are, under the Bye-laws, bound to pay their annual subscriptions until they shall withdraw from it by notice in writing to the Secretary.

PAYMENTS.—Subscriptions may be paid to the Secretary, either at the office of the Society, 16 Bedford Square, London, W.C.; or by means of crossed cheques in favour of the Secretary, or by crossed postal orders. When making remittances it should be stated by whom, and on whose account, they are sent. All Cheques and Postal Orders should be crossed "London and Westminster Bank."

On application to the Secretary, forms may be obtained for authorising the regular payment, by the Bankers of individual Members, of each annual subscription as it falls due. Members are particularly invited to avail themselves of these Bankers' orders, in order to save trouble both to themselves and to the Society. When payment is made to the London and Westminster Bank, as the Bankers of the Society, it will be desirable that the Secretary should be advised by letter of such payment, in order that the entry in the Bankers' book may be at once identified, and the amount posted to the credit of the proper person. No coin can be remitted by post, unless the letter be registered.

JOURNAL.—The Volumes of the Society's Journal are (when the subscription is not in arrear) forwarded by post to Members, or delivered from the Society's Office to Members, or to the bearer of their written order.

The back numbers of the Journal are kept constantly on sale by the publisher, Mr. JOHN MURRAY, 50A Albemarle Street, W.

LINCOLN MEETING, JUNE 25 TO 29, 1907. Entries close: Implements, March 15; post entries, April 1. Live Stock, May 14; post entries, May 28. Riding and Driving Classes, May 28. Poultry, May 28. Produce, May 14; post entries (except cider and perry), May 28.

NEW MEMBERS.—Every candidate for admission into the Society must be nominated by a Governor or Member, and must duly fill up and sign an application for Membership on the appointed form. Forms of proposal may be obtained on application to the Secretary, who will inform new Members of their election by letter.

Royal Agricultural Society of England.

(*Established May* 9, 1838, *as the* ENGLISH AGRICULTURAL SOCIETY, *and Incorporated by Royal Charter on March* 26, 1840.)

Patron.

HIS MOST GRACIOUS MAJESTY THE KING.

President for 1907.

The EARL OF YARBOROUGH,

BROCKLESBY PARK, LINCOLNSHIRE.

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Year when elected on Council	
1895	H.R.H. THE PRINCE OF WALES, K.G., *Marlborough House, S.W.*
1895	BEDFORD, Duke of, K.G., *Woburn Abbey, Bedfordshire.*
1882	CAWDOR, Earl, *Stackpole Court, Pembrokeshire.*
1893	CORNWALLIS, F. S. W., *Linton Park, Maidstone, Kent.*
1885	COVENTRY, Earl of, *Croome Court, Severn Stoke, Worcestershire.*
1895	DERBY, Earl of, K.G., *Knowsley, Prescot, Lancashire.*
1871	EGERTON OF TATTON, Earl, *Tatton Park, Knutsford, Cheshire.*
1881	GILBEY, Sir WALTER, Bart., *Elsenham Hall, Elsenham, Essex.*
1899	MIDDLETON, Lord, *Birdsall House, York.*
1880	MORETON, Lord, *Sarsden House, Chipping Norton, Oxon.*
1874	SPENCER, Earl, K.G., *Althorp, Northampton.*
1881	THOROLD, Sir JOHN H., Bart., *Syston Park, Grantham, Lincolnshire.*

Vice-Presidents.

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1887	CRUTCHLEY, PERCY, *Sunninghill Lodge, Ascot, Berkshire.*
1891	DUGDALE, J. MARSHALL, *Llwyn, Llanfyllin, S.O., Mont.*
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1876	FEVERSHAM, Earl of, *Duncombe Park, Helmsley, Yorkshire.*
1883-90, 1894	JERSEY, Earl of, G.C.B., G.C.M.G., *Middleton Park, Bicester, Oxon.*
1899	NORTHBROOK, Earl of, *Stratton, Micheldever Station, Hampshire.*
1881	PARKER, Hon. CECIL T., *Eccleston, Chester.*
1869	WHITEHEAD, CHARLES, *Barming House, Maidstone, Kent.*

Ordinary Members of the Council.

Year when first elected on Council	
1905	ADAMS, GEORGE, *Royal Prize Farm, Faringdon* (*Berkshire*).
1905	ADEANE, CHARLES R. W., *Babraham Hall, Cambridge* (*Cambridgeshire*).
1905	AVELING, THOMAS L., *Boley Hill House, Rochester* (*Kent*).
1905	BANKART, S. N., *Hallaton Hall, Uppingham* (*Rutland*).
1905	BARKER, JOHN, M.P., *The Grange, Bishop's Stortford* (*Essex*).
1906	BROCKLEHURST, HENRY DENT, *Sudeley Castle, Winchcombe* (*Gloucestershire*).
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1905	CARDEN, R. G., *Fishmoyne, Borrisoleigh, Tipperary* (*Ireland*).
1905	CARR, RICHARDSON, *Estate Office, Tring Park* (*Hertfordshire*).
1905	COOPER, SIR RICHARD P., Bart., *Shenstone Court, Lichfield* (*Staffs*).
1906	DE TRAFFORD, Sir H. F., Bt., *Hill Crest, Market Harboro'* (*Leicestershire*).
1906	DUDDING, HENRY, *Riby Grove, Stallingborough* (*Lincolnshire*).
1905	EADIE, JOHN T. C., *The Knowle, Hazelwood, Derby* (*Derbyshire*).
1905	FALCONER, JAMES, *Northbrook Farm, Micheldever Station* (*Hampshire*).
1905	FORREST, ROBERT, *St. Fagan's, Cardiff* (*Glamorganshire*).
1906	GLOVER, JAMES W., 12, *Jury Street, Warwick* (*Warwickshire*).
1900	GREAVES, R. M., *Wern, Portmadoc* (*North Wales*).
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1905	HARRIS, JOSEPH, *Brackenbrough Tower, Carlisle* (*Cumberland*).
1903	HARRISON WILLIAM, *Hall House, Leigh* (*Lancashire*).
1905	HINE, JOHN HENRY, *Pomphlett Farm, Plymstock, Plymouth* (*Devon*).
1906	HIPPISLEY, R. J. BAYNTUN, *Ston Easton Park, Bath* (*Somerset*).
1905	HISCOCK, ARTHUR, jun., *Manor Farm, Motcombe, Shaftesbury* (*Dorset*).
1903	HOBBS, ROBERT W., *Kelmscott, Lechlade* (*Oxfordshire*).
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1905	INGRAM, WALTER F., 2 *St. Andrew's Place, Lewes* (*Sussex*).
1905	KNIGHTLEY, Sir CHARLES V., Bart., *Fawsley, Daventry* (*Northants*).
1905	LOBB, GEORGE, *Lawhitton, Launceston* (*Cornwall*).
1904	MATHEWS, ERNEST, *Little Shardeloes, Amersham* (*Buckinghamshire*).
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1904	MIDDLETON, CHRISTOPHER, *Vane Terrace, Darlington* (*Durham*).
1884	MILLER, T. HORROCKS, *Singleton Park, Poulton-le-Fylde* (*Lancashire*).
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1904	PALMER, RALPH C., 9 *Little Stanhope Street, Mayfair, W.* (*London*).
1905	PILKINGTON, CLAUDE M. S., *Wollaton, Nottingham* (*Nottinghamshire*).
1906	PLUMPTRE, H. FITZWALTER, *Goodnestone, Dover* (*Kent*).
1905	REA, GEORGE GREY, *Middleton, Wooler* (*Northumberland*).
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1905	RICHMOND AND GORDON, Duke of, K.G., *Goodwood, Chichester* (*Sussex*).
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1905	ROWELL, JOHN, *Bury, Huntingdon* (*Huntingdonshire*).
1901	SCOBY, WILLIAM, *Hobground House, Sinnington, York* (*Yorkshire, North Riding*).
1903	SHACKLE, ERNEST W., *Redleaf, Hayes* (*Middlesex*).
1886	SMITH, ALFRED J., *Rendlesham, Woodbridge* (*Suffolk*).
1905	SMITH, HENRY HERBERT, *Bowood, Calne* (*Wiltshire*).
1891	STANYFORTH, E. WILFRID, *Kirk Hammerton Hall, York* (*Yorkshire, West Riding*).
1875	STRATTON, RICHARD, *The Duffryn, Newport* (*Monmouthshire*).
1905	TALLENT, HERBERT, *Westacre, Swaffham* (*Norfolk*).
1905	TAYLOR, GEORGE, *Cranford* (*Middlesex*).
1905	THORNTON, JOHN, 7 *Princes Street, Hanover Square, W.* (*London*).
1904	TURNER, ARTHUR P., *The Leen, Pembridge* (*Herefordshire*).
1889	WHEELER, E. VINCENT V., *Newnham Court, Tenbury* (*Worcestershire*).
1889	WILSON, CHRISTOPHER W., *Rigmaden Park, Kirkby Lonsdale* (*Westmorland*).

STANDING COMMITTEES.

*** Under Bye-law 39, the PRESIDENT is a Member *ex officio* of all Committees, and the TRUSTEES and VICE-PRESIDENTS are Members *ex officiis* of all Standing Committees except the Committee of Selection.

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STANYFORTH, E. W.
TURNER, A. P.

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WHEELER, E. V. V. (*Chairman*).
ONSLOW, Earl of, G.C.M.G.
THOROLD, Sir J. H., Bart.
BOWEN-JONES, J.
CORNWALLIS, F. S. W
MIDDLETON, C.
REYNARD, F.
ROGERS, C. C.
SHACKLE, ERNEST.
TALLENT, H.
WHITEHEAD, C.

Veterinary Committee.

NORTHBROOK, Earl of (*Chairman*).
DERBY, Earl of, K.G.
MORETON, Lord.
CAVENDISH, Rt. Hon. V.
FELLOWES, Rt. Hon. A. E.
PARKER, Hon. C. T.
GREENALL, Sir G., Bart.
THOROLD, Sir J. H., Bart.
BANKART, S. N.
CRUTCHLEY, PERCY.
HARRIS, JOSEPH.
HISCOCK, A., Jun.
MCFADYEAN, Prof. Sir J.
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MATHEWS, ERNEST.
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ROWELL, JOHN.
SMITH, A. J.
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WILSON, C. W.

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NORTHBROOK, Earl of.
MIDDLETON, Lord.
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GREENALL, Sir G., Bart.
BOWEN-JONES, J.
BUTTAR, T. A.
CARDEN, R. G.
CARR, RICHARDSON.
CRUTCHLEY, PERCY.
DUDDING, H.
EADIE, J. T. C.
GREAVES, R. M.
HOBBS, ROBERT W.
MATHEWS, E.
MINTON, T. S.
REA, G. G.
ROWELL, JOHN.
SMITH, A. J.
STRATTON, R.
TURNER, A. P.
WHEELER, E. V. V.
WILSON, C. W.
The Stewards of Live Stock.

Implement Committee.

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THOROLD, Sir J. H., Bart.
ADAMS, GEORGE.
AVELING, T. L.
BOWEN-JONES, J.
CRUTCHLEY, PERCY.
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FORREST, R.
GLOVER, J. W.
HARRISON, W.
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HOWARD, JOHN HOWARD.
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STANYFORTH, E. W.
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PARKER, Hon. C. T.
COOPER, Sir R. P., Bart.
AVELING, T. L.
CARR, RICHARDSON.
CRUTCHLEY, PERCY.
FORREST, R.
HARRISON, W.
REA, G. G.
STANYFORTH, E. W.
TAYLOR, GEORGE.

Committee of Selection.

THOROLD, Sir J. H., Bart. (*Chairman*).
THE PRESIDENT.
ONSLOW, Earl of, G.C.M.G.
FELLOWES, Rt. Hon. A. E.
CARR, RICHARDSON.
CORNWALLIS, F. S. W.
HARRISON, W.
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MATHEWS, E.
MAY, W. A.
PALMER, R. C.
WHEELER, E. V. V.

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MATHEWS, ERNEST (*Chairman*).
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PARKER, Hon. C. T.
THOROLD, Sir J. H., Bart.
CARR, RICHARDSON.
CRUTCHLEY, PERCY.
GREAVES, R. M.
HARRIS, JOSEPH.
HINE, J. H.
HISCOCK, A., Jun.
PLUMPTRE, H. F.
TAYLOR, GEORGE.
THORNTON, JOHN.
WHEELER, E. V. V.

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LUBBOCK, EDGAR.
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PENNELL, C. W.
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TWEED, E. E. (Local Secretary).

Secretary.

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DISTRIBUTION OF GOVERNORS AND MEMBERS OF THE SOCIETY, AND OF ORDINARY MEMBERS OF THE COUNCIL.

(*Elected in accordance with the Bye-laws enacted on May* 31, 1905, *and numbered* 57-93.)

Electoral District	Division	Number of Governors and Members	Number of Ordinary Members of Council	Ordinary Members of Council
A.	Bedfordshire .	103	1	J. H. Howard.
	Cheshire. . .	265	1	Sir Gilbert Greenall.
	Cornwall . .	97	1	G. Lobb.
	Derbyshire . .	165	1	J. T. C. Eadie.
	Dorset . . .	67	1	A. Hiscock, jun.
	Hampshire and Channel Islands	232	1	J. Falconer.
	Hertfordshire .	214	1	Richardson Carr.
	Lancashire and Isle of Man. .	329	2	William Harrison; T. H. Miller.
	Middlesex . .	244	2	E. W. Shackle; G. Taylor.
	Monmouthshire .	63	1	R. Stratton.
	Norfolk . . .	266	1	H. Tallent.
	Northamptonshire	200	1	Sir C. V. Knightley.
	Northumberland .	195	1	G. G. Rea.
	Staffordshire .	311	1	Sir R. P. Cooper.
	Worcestershire .	171	1	E. V. V. Wheeler.
	Yorkshire, N.R. .	166	1	W. Scoby.
	Scotland. . .	210	1	T. A. Buttar.
		—— 3,298	— 19	
B.	Buckinghamshire .	152	1	E. Mathews.
	Devon . . .	156	1	J. H. Hine.
	Durham . . .	123	1	C. Middleton.
	Essex . . .	214	1	John Barker.

DISTRIBUTION OF GOVERNORS AND MEMBERS OF THE SOCIETY—*continued.*

Electoral District	Division	Number of Governors and Members	Number of Ordinary Members of Council	Ordinary Members of Council.
B. *Contd.*	Herefordshire	137	1	A. P. Turner.
	Leicestershire	274	1	Sir H. F. de Trafford.
	London	609	3	W. A. May; R. C. Palmer; John Thornton.
	Nottinghamshire	161	1	C. M. S. Pilkington.
	Rutland	21	1	S. N. Bankart.
	Shropshire	275	1	T. S. Minton.
	Suffolk	215	1	A. J. Smith.
	Surrey	240	1	Earl of Onslow.
	Wiltshire	129	1	H. H. Smith.
	Yorkshire, W.R.	265	1	E. W. Stanyforth.
	South Wales	117	1	C. C. Rogers.
		——3,088	— 17	
C.	Berkshire	234	1	George Adams.
	Cambridgeshire	172	1	C. R. W. Adeane.
	Cumberland	100	1	Joseph Harris.
	Glamorgan	86	1	R. Forrest.
	Gloucestershire	259	1	H. D. Brocklehurst.
	Huntingdonshire	50	1	John Rowell.
	Kent	444	2	T. L. Aveling; H. F. Plumptre.
	Lincolnshire	241	1	Henry Dudding.
	Oxfordshire	142	1	R. W. Hobbs.
	Somerset	122	1	R. J. Bayntun Hippisley.
	Sussex	317	2	W. F. Ingram; Duke of Richmond and Gordon.
	Warwickshire	250	1	J. W. Glover.
	Westmorland	63	1	C. W. Wilson.
	Yorkshire, E.R.	121	1	F. Reynard.
	Ireland	140	1	R. G. Carden.
	North Wales	177	1	R. M. Greaves.
		——2,918	— 18	
Foreign Countries		276		
Members with no Addresses		20		
Grand Totals		9,600	54	

GOVERNORS OF THE SOCIETY.

	Date of election as Member	Date of election as Governor
HIS MAJESTY THE KING...Windsor Castle	—	Feb. 3, 1864
T †H.R.H. The Prince of Wales, K.G....Marlborough House, S.W., and Sandringham, Norfolk	—	April 6, 1892
VP H.R.H. Prince Christian of Schleswig-Holstein, K.G....Cumberland Lodge, Windsor	—	Aug. 4, 1875
†Aberdare, Lord...Longwood, Winchester	April 1, 1885	Aug. 1, 1905
†Acland, Alfred Dyke...Danesbury, Welwyn	Oct. 8, 1902	Feb. 4, 1903
‖Adeane, C. R. W....Babraham Hall, Cambridge	Nov. 6, 1889	Jan. 10, 1906
Alington, Lord...Crichel, Wimborne	May 7, 1879	April 4, 1906
†Allcroft, Herbert John...Stokesay Court, Onibury, Salop	—	Dec. 12, 1888
†Amherst of Hackney, Lord...Didlington Hall, Brandon	Feb. 2, 1859	May 7, 1890
Ancaster, Earl of...Normanton Park, Stamford	Mar. 3, 1869	May 5, 1875
Ann, Sir Edwin T....West Parkfields, Kedleston Road, Derby	—	Aug. 1, 1906
Archer-Houblon, George B....Hallingbury Place, Bishop's Stortford	—	Mar. 6, 1889
Ashworth, Alfred...Horsley Hall, Gresford	Dec. 2, 1868	Feb. 1, 1905
†Assheton, R. C....Hall Foot, Clitheroe	Mar. 6, 1889	May 30, 1906
Astor, Waldorf...Cliveden, Taplow, Bucks	—	Jan. 30, 1907
Baring, Godfrey, M.P....Nubia House, Cowes, Isle of Wight	—	May 2, 1906
Barnard, Lord...Raby Castle, Darlington	—	July 27, 1892
Barrymore, Lord...20 Hill Street, Berkeley Square, W.	Feb. 4, 1885	April 4, 1906
Bath, Marquis of...Longleat, Warminster	June 22, 1892	April 4, 1906
Bathurst, Earl, C.M.G....Cirencester House, Cirencester	July 3, 1889	April 4, 1906
Beck, A. Cecil, M.P....The How, St. Ives, Hunts.	—	Jan. 30, 1907
T †Bedford, Duke of, K.G....Woburn Abbey, Bedfordshire	—	May 3, 1893
†Beever, W. F. Holt...Yewden Lodge, Henley-on-Thames	April 2, 1879	June 6, 1894
†Belper, Lord...Kingston Hall, Notts.	July 6, 1881	Mar. 6, 1895
†Benn, Thomas G....Thornton Gate, Rossall Beach, Fleetwood, R.S.O.	Mar. 13, 1878	Aug. 2, 1882
Bentinck, Lord Henry...Underley, Kirkby Lonsdale	Dec. 12, 1888	Jan. 10, 1906
Binney, J....Pampisford Hall, near Cambridge	—	Jan. 10, 1906
Birkin, Sir T. I., Bart....Ruddington Grange, near Nottingham	Dec. 10, 1890	May 2, 1906
†Blyth, Sir James, Bart....Blythwood, Stansted, Essex	Nov. 3, 1875	July 27, 1892
Bowen, G. W. H....Ickleton Grange, Gt. Chesterford, Essex	Nov. 2, 1892	Mar. 7, 1906
VP Bowen-Jones, J. B....St. Mary's Court, Shrewsbury	Mar. 6, 1867	Feb. 1, 1905
Brassey, Henry Leonard C....Apethorpe Hall, Wansford, Northants.	—	Feb. 3, 1892
Briscoe, W. A....Longstowe Hall, Cambridge	—	Jan. 10, 1906
Brownlow, Earl...Belton House, Grantham	Aug. 3, 1887	April 4, 1906
Buchanan, James...Graffham, Petworth	—	July 27, 1904
Burghclere, Lord...48 Charles Street, Berkeley Square, W.	—	Dec. 7, 1892
Burns, Walter S. M....22 Old Broad Street, E.C.	—	April 4, 1906
Burton, Lord, K.C.V.O....Rangemore, Burton-on-Trent	Nov. 7, 1888	June 25, 1890
Cadogan, Earl, K.G....Culford Hall, Bury St. Edmunds	—	Dec. 11, 1889
Calthorpe, Lord...Elvetham, Winchfield	Nov. 7, 1883	May 2, 1894
Carrington, Earl, K.G....Daws Hill, High Wycombe.	—	Mar. 7, 1906
VP †Cavendish, Rt. Hon. Victor C.W., M.P....Holker Hall, Lancashire	—	Mar. 2, 1892
T †Cawdor, Earl...Stackpole Court, Pembrokeshire	Mar. 3, 1863	Mar. 2, 1892
†Cawston, George...The Manor House, Cawston, Norfolk	—	June 6, 1894
VP Chaplin, Rt. Hon. Henry...Stafford House, S.W.	—	Nov. 2, 1870
Chelsea, Viscount...48 Bryanston Square, W.	—	Feb. 6, 1895
Chetwynd, G. J. B....Wyndthorpe, near Doncaster	May 4, 1904	May 7, 1906
†Clarendon, Earl of, G.C.B....The Grove, Watford	June 5, 1872	May 2, 1894
Clifden, Viscount...Lanhydrock, Bodmin	July 13, 1883	Mar. 7, 1906

T Trustee. VP Vice-President. † Life Governor. ‖ Member of Council.

	Date of Election as Member	Date of Election as Governor
COBHAM, Viscount...Hagley Hall, Stourbridge	Dec. 8, 1875	April 4, 1906
COCKBURN, N. C....Harmston Hall, Lincoln	May 4, 1892	April 4, 1906
COLEBROOKE, Lord...Stratford House, Stratford Place, W.	—	May 2, 1906
COOPER, Sir Daniel, Bart....Warren Tower, Newmarket	Feb. 4, 1891	Jan. 10, 1906
‖COOPER, Sir Richard P., Bart....Shenstone Court, Lichfield	Dec. 12, 1888	Jan. 30, 1907
T CORNWALLIS, Fiennes S. W....Linton Park, Maidstone	—	July 2, 1884
†COTTERELL, Sir John, Bart....Garnons, Hereford	May 6, 1896	Dec. 12, 1906
T †COVENTRY, Earl of...Croome Court, Severn Stoke, Worc.	April 1, 1863	April 4, 1894
†COX, Frederick...Harefield Place, Uxbridge	—	July 31, 1901
CRAVEN, Thomas...Kirklington Hall, Southwell, Notts.	May 6, 1891	Dec. 6, 1893
CREWE, Earl of...Crewe Hall, Crewe, Cheshire	Feb. 6, 1884	Mar. 7, 1894
VP †CRUTCHLEY, Percy...Sunninghill Lodge, Ascot	June 3, 1879	Feb. 1, 1905
CURTIS, Charles C....South Collingham, Newark, Notts.	Feb. 4, 1887	April 4, 1906
CURTIS-HAYWARD, Lt.-Col. J. F....Quedgeley House, Gloucester	Feb. 1, 1888	Dec. 12, 1906
DARTMOUTH, Earl of...Patshull Hall, Wolverhampton	—	Dec. 9, 1891
DAVIES, David, M.P....Plas Dinam, Llandinam, Mont.	June 1, 1904	Mar. 7, 1906
DE LA RUE, Ernest...Lower Hare Park, Newmarket	—	April 4, 1906
T †DERBY, Earl of, K.G., G.C.B....Knowsley, Prescot	June 3, 1874	May 2, 1894
DE ROTHSCHILD, Alfred C....Halton, Tring	—	Mar. 7, 1906
DERWENT, Lord...Hackness Hall, Scarborough	—	April 7, 1869
DESBOROUGH, Lord...Taplow Court, Maidenhead	Dec. 12, 1888	Feb. 7, 1906
‖†DE TRAFFORD, Sir H. F., Bart....Hill Crest, Market Harborough	Aug. 1, 1883	June 1, 1892
†DEVONSHIRE, Duke of, K.G....Chatsworth, Chesterfield	—	June 2, 1880
†DEWHURST, G. Littleton...Beechwood, Lymm, Cheshire	Dec. 9, 1891	May 2, 1894
†DICKSON-POYNDER, Sir J., Bart., M.P....Hartham Park, Corsham, Wilts.	Nov. 2, 1887	April 2, 1890
DIGBY, Lord...Minterne House, Cerne Abbas, Dorset	—	July 25, 1894
DORMER, John Cottrell...Cokethorpe, Witney, Oxon.	—	April 4, 1906
DOWNSHIRE, Marquis of...Easthampstead Park, Wokingham	—	Feb. 7, 1906
DUCIE, Earl of...Tortworth Court, Falfield, R.S.O., Glos.	May 5, 1869	Feb. 1, 1905
DUGDALE, James Broughton...Wroxall Abbey, Warwick	Feb. 3, 1892	June 28, 1905
VP DUGDALE, John Marshall...Llwyn, Llanfyllin, S.O., Mont.	Feb. 1, 1888	Feb. 1, 1905
†DULEEP-SINGH, Prince Frederick...Old Buckenham Hall, Attleborough	—	July 25, 1894
DUNCOMBE, Capt. W. H. O....Waresley Park, Sandy, Beds.	April 1, 1885	May 6, 1896
†DUNMORE, Earl of...Isle of Harris, by Portree, N.B.	—	Feb. 3, 1869
†DURHAM, Earl of...Lambton Castle, Durham	—	July 14, 1880
T EGERTON OF TATTON, Earl...Tatton Park, Knutsford	Mar. 6, 1872	Nov. 7, 1883
†ELLESMERE, Earl of...Worsley Hall, Manchester	—	July 7, 1869
ELLIOT, Sir Charles, Bart....Beesthorpe Hall, Newark-on-Trent	—	May 2, 1906
ESSEX, Earl of...9 Mansfield Street, W.	Nov. 7, 1888	Nov. 2, 1892
EVANS, Lewis, F.S.A....Russells, Watford	—	July 27, 1904
EXETER, Marquis of...Burghley House, Stamford	May 4, 1898	June 21, 1898
FARQUHAR, Granville...24, Park Street, Grosvenor Square, W.	Feb. 6, 1889	April 4, 1906
FARRAR, Sidney Howard...2 King's Gardens, Hove	—	Feb. 7, 1906
VP FELLOWES, Rt. Hon. Ailwyn E....Honingham, Norwich	Dec. 12, 1888	May 31, 1905
VP FEVERSHAM, Earl of...Duncombe Park, Helmsley, Yorks.	Mar. 5, 1862	Mar. 3, 1875
FIFE, Duke of, K.T....15 Portman Square, W.	—	Nov. 7, 1888
FITZHARDINGE, Lord...Berkeley Castle, Glos.	Mar. 4, 1885	Feb. 1, 1905
‖†FORREST, Robert...St. Fagan's, Cardiff	Feb. 6, 1878	May 30, 1906
FOX, J. St. V....Girsby Manor, Lincoln	—	Feb. 7, 1906
FURNESS, Sir Christopher, M.P....Grantley Hall, Ripon	—	Jan. 10, 1906
GERARD, Lord...Eastwell Park, Ashford, Kent.	April 13, 1904	Jan. 10, 1906
GIBSON, William...112 Regent Street, W.	—	Feb. 7, 1906
T GILBEY, Sir Walter, Bart....Elsenham Hall, Elsenham, Essex	Nov. 2, 1870	June 5, 1889
GLENESK, Lord...139 Piccadilly, W.	—	Dec. 12, 1888

T Trustee. VP Vice-President. † Life Governor. ‖ Member of Council.

	Date of Election as Member	Date of Election as Governor
GOLDSMID, Oliver E. d'Avigdor...Somerhill, near Tonbridge	—	Mar. 5, 1902
GRAFTON, Duke of, K.G....Wakefield Lodge, Stony Stratford	—	June 3, 1884
†GRANT, Sir G. Macpherson, Bart....Ballindalloch Castle, Ballindalloch, N.B.	April 1, 1863	April 2, 1890
GRAY, Harold S....Gog Magog Hills, Cambs.	—	April 4, 1906
‖†GREENALL, Sir Gilbert, Bart....Walton Hall, Warrington	Feb. 3, 1892	May 2, 1894
GRIFFITHS, John James...Highbury Grange, Highbury, N.	—	May 1, 1889
GROVES, James Grimble...Bank Hall, Chapel-en-le-Frith, Derbyshire	—	May 1, 1895
HADDINGTON, Earl of, K.T....Tyninghame, Prestonkirk, N.B.	—	April 4, 1906
HALL, A. C....Six Mile Bottom, Cambridge	June 6, 1894	Feb. 7, 1906
HAMILTON AND BRANDON, Duke of, Hamilton Palace, Hamilton, N.B.	—	Aug. 1, 1905
HARDING, Colonel T. Walter...Madingley Hall, Cambridge	—	Feb. 7, 1906
HAREWOOD, Earl of...Harewood House, Leeds	June 6, 1883	Nov. 2, 1892
HAVERSHAM, Lord...South Hill Park, Bracknell	Dec. 12, 1888	April 4, 1906
†HENDERSON, Sir Alex., Bart....Buscot Park, Faringdon, Berks.	Nov. 5, 1890	July 28, 1897
HENDERSON, Capt. Harold G....Kitemore, Faringdon	—	Mar. 7, 1906
†HENRYSON-CAIRD, James A....Cassencary, Creetown R.S.O., Kirkcudbright	May 7, 1873	July 31, 1895
HERTFORD, Marquis of...Ragley Park, Alcester	Aug. 2, 1882	May 7, 1884
†HEYWOOD, Sir Arthur Percival, Bart....Doveleys, Uttoxeter	April 7, 1875	Feb. 2, 1898
†HOLFORD, Major George L., C.V.O., C.I.E....Westonbirt House, Tetbury, Glos.	—	April 6, 1892
HOOLEY, Terah F....Papworth Hall, near Cambridge	—	Nov. 7, 1906
†HORNSBY, James...Laxton Park, Stamford	June 6, 1878	May 29, 1895
†HOTHFIELD, Lord...Hothfield Place, Ashford, Kent	—	May 7, 1879
HOWARD DE WALDEN, Lord...Seaford House, Belgrave Square, S.W.	—	Mar. 7, 1906
ILCHESTER, Earl of...Melbury, Dorchester	—	April 4, 1906
INNES, H. McLeod...Trinity College, Cambridge	—	Mar. 7, 1906
†IRWIN, Colonel Thomas A....Lynehow, Carlisle	May 5, 1880	June 25, 1895
†IVEAGH, Viscount, K.P....5 Grosvenor Place, S.W.	—	June 6, 1894
JAMES, William D....West Dean Park, Chichester	Nov. 7, 1894	Feb. 7, 1906
VP†JERSEY, Earl of, G.C.B., G.C.M.G....Middleton Park, Bicester	June 30, 1875	April 4, 1894
JOICEY, E....Blenkinsopp Hall, Haltwhistle, Northumberland	—	Dec. 12, 1888
†JONES, Walter J. H....Blakemere, Hartford, Cheshire	April 11, 1888	May 2, 1894
JONES, William C....Llanerch Park, Trefnant, R.S.O.	—	May 30, 1906
†KINGSCOTE, Col. Sir Nigel, G.C.V.O., K.C.B....Kingscote, Wotton-under-Edge, Glos.	April 6, 1854	July 1, 1874
†KLEINWORT, Herman Greverns...Wierton Place, Boughton Monchelsea, Kent	—	June 4, 1902
§KOLHAPUR, H.H. The Raja of, G.C.S.I....Kolhapur, India	—	Feb. 6, 1889
†KYNNERSLEY Thomas F....Leighton Hall Ironbridge, Salop	Nov. 7, 1883	Nov. 4, 1891
†LANSDOWNE, Marquis of, K.G., G.C.S.I....Bowood, Calne, Wilts.	Feb. 3, 1875	Feb. 5, 1896
LATHOM, Earl of...Lathom House, Ormskirk	—	Nov. 4, 1903
LAYCOCK, J. F....Wiseton, Bawtry, S.O., Yorks.	Nov. 2, 1887	May 2, 1906
†LECONFIELD, Lord...Petworth House, Sussex	—	Mar. 6, 1901
LEEDS, Duke of...Hornby Castle, Bedale	Nov. 6, 1901	Aug. 1, 1906
†LEICESTER, Earl of, K.G....Holkham Hall, Norfolk	—	Nov. 15, 1843
LICHFIELD, Earl of...Shugborough, Staffs (representing National Provincial Bank of England)	May 1, 1889	Aug. 1, 1906
†LINLITHGOW, Marquis of, K.T., G.C.M.G., G.C.V.O....Hopetoun House, South Queensferry, N.B.	Nov. 7, 1888	July 31, 1895
†LLANGATTOCK, Lord...The Hendre, Monmouth	Mar. 1, 1871	May 2, 1894
LONDESBOROUGH, Earl of...Londesborough Park, Market Weighton	—	Nov. 7, 1906
†LONDONDERRY, Marquis of, K.G....Wynyard Park, Stockton-on-Tees	—	June 3, 1885

† Life Governor. § Honorary Member. ‖ Member of Council. VP Vice-President.

	Date of election as Member	Date of election as Governor
†LONG, Rt. Hon. Walter H., M.P....Rood Ashton, Trowbridge, Wilts. .	Aug. 4, 1880	Dec. 11, 1895
†LONSDALE, Earl of...Lowther Castle, Penrith	—	July 4, 1883
†LOPES, Rt. Hon. Sir Massey, Bart....Maristow, Roborough, Devon .	Mar. 15, 1848	May 7, 1884
LUCAS, Lord...Wrest Park, Ampthill, Beds.	—	Mar. 7, 1906
LUDLOW, Lord...Heywood, Westbury, Wilts.	—	May 30, 1906
MACIVER, Colin...Statham Lodge, near Warrington . . .	April 6, 1881	Feb. 7, 1906
MAIR-RUMLEY, J. G....The Hammonds, Udimore, S.O., Sussex .	June 5, 1901	Feb. 1, 1905
MALMESBURY, Earl of...Heron Court, Christchurch, Hants. . .	—	May 2, 1906
MANNERS, Lord...Avon Tyrrell, Christchurch, Hants . . .	Dec. 12, 1888	April 4, 1906
MANVERS, Earl...Thoresby Park, Ollerton, Notts. . . .	Feb. 1, 1888	April 4, 1906
MEYER, Carl...Shortgrove, Newport, Essex	—	Feb. 7, 1906
T MIDDLETON, Lord...Birdsall House, York	—	Mar. 3, 1875
MIDWOOD, G. Norris...Brown Street, Salford	April 11, 1888	Mar. 5, 1902
MILDMAY, F. B., M.P....Flete, Ivy Bridge, Devon . . .	—	Nov. 1, 1905
MONTEFIORE, Rev. D. B....The World's End, Islip, Oxon . .	Feb. 6, 1901	Mar. 5, 1902
†MOORSOM-MITCHINSON-MAUDE, C. R....Harewood, Leeds . .	Dec. 2, 1857	July 26, 1893
T†MORETON, Lord...Sarsden House, Chipping Norton, Oxon. .	—	Mar. 3, 1875
†MOREWOOD, C. R. Palmer...Alfreton Park, Derbyshire . .	April 7, 1875	Feb. 7, 1894
†MOUNT-EDGCUMBE, Earl of, G.C.V.O...Mount-Edgcumbe, Plymouth	Nov. 6, 1861	Mar. 5, 1890
MOUNTENEY-JEPHSON, A. J....Adbury Holt, Newbury, Berks. .	—	Aug. 1, 1905
MUNCASTER, Lord...Muncaster Castle, Ravenglass, Cumberland .	—	June 23, 1891
NEELD, Lt.-Col. Sir Audley D., Bart., C.B., M.V.O....Grittleton, Chippenham	—	July 31, 1901
NEWCASTLE, Duke of...Clumber, Worksop . . .	—	May 2, 1906
NORFOLK, Duke of, K.G....Arundel Castle, Sussex . . .	—	July 29, 1891
NORMANTON, Earl of...Somerley, Ringwood	—	April 4, 1906
VP NORTHBROOK, Earl of...Stratton, Micheldever, Hants . .	June 2, 1880	Feb. 1, 1905
‖†ONSLOW, Earl of, G.C.M.G....Clandon Park, Guildford, Surrey .	Nov. 3, 1880	May 27, 1903
†PALMER, Sir Walter, Bart....50 Grosvenor Square, W. . . .	—	Feb. 1, 1899
VP†PARKER, Hon. Cecil T....Eccleston, Chester	April 7, 1876	May 25, 1898
†PARR, Roger Charlton...Grappenhall Heyes, Warrington . .	May 7, 1902	July 30, 1902
†PEARSON, Sir Weetman D., Bart., M.P....Paddockhurst, Worth, Sussex	Nov. 6, 1895	Aug. 1, 1905
PECKOVER, Alexander, LL.D....Bank House, Wisbech . . .	May 7, 1894	Feb. 7, 1906
PENARANDA, Duke of...Palacio Liria, Madrid, Spain . . .	—	Feb. 7, 1906
PERKS, R. W., M.P....11 Kensington Palace Gardens, W. . .	—	Mar. 7, 1906
PHILLIPS, Frederick S....Sunnyside, Holmwood, Surrey . .	—	Mar. 7, 1906
PHILLIPS, Lionel...Tilney Hall, Winchfield, Hants. . . .	—	June 28, 1905
†PLATT, Col. Henry, C.B....Gorddinog, Llanfairfechan . . .	Mar. 5, 1862	Feb. 3, 1897
†PLATT, James E....Howbury Hall, near Bedford. . . .	June 30, 1886	May 1, 1895
†PLYMOUTH, Earl of, C.B....Hewel Grange, Bromsgrove . .	—	Nov. 6, 1878
†PORTLAND, Duke of, K.G....Welbeck Abbey, Worksop. . .	—	June 2, 1880
†PORTMAN, Viscount...Bryanston, Blandford	Aug. 6, 1862	Mar. 5, 1890
PORTSMOUTH, Earl of...Hurstbourne Park, Whitchurch, Hants .	—	Dec. 9, 1891
†POWIS, Earl of...Powis Castle, Welshpool	April 6, 1887	June 23, 1891
†QUILTER, Sir W. Cuthbert, Bart....Bawdsey Manor, Woodbridge, Suffolk	Mar. 3, 1886	April 7, 1897
RADNOR, Earl of...Longford Castle, Salisbury	—	April 9, 1902
†RAMSDEN, Lt.-Col. W. J. F....Rogerthorpe Manor, Pontefract .	May 2, 1883	June 25, 1895
†REDESDALE, Lord, G.C.V.O....Batsford Park, Moreton-in-Marsh, Glos.	—	Nov. 3, 1886
REISS, James E....36 Cadogan Square, S.W.	Feb. 7, 1883	May 2, 1894
‖RICHMOND AND GORDON, Duke of, K.G....Goodwood, Chichester .	—	April 13, 1904
†RIDLEY, Viscount...36 Portland Place, W.	—	June 5, 1901

T Trustee. VP Vice-President. † Life Governor. ‖ Member of Council.

	Date of election as Member	Date of election as Governor
RIPON, Marquis of, K.G....Studley Royal, Ripon.	—	July 3, 1861
ROLLE, Hon. Mark...Bicton, East Budleigh, Devon	—	Nov. 7, 1894
ROSE, C. D., M.P....53 Berkeley Square, W.	—	Jan. 10, 1906
†ROSEBERY, Earl of, K.G....38 Berkeley Square, W.	—	June 6, 1894
ROTHSCHILD, Lord, G.C.V.O....148 Piccadilly, W.	Nov. 7, 1888	June 4, 1890
ROTHSCHILD, Leopold de...Ascott, Wing, Leighton Buzzard	—	Mar. 1, 1893
ROTHSCHILD, Hon. N. Charles...Ashton Wold, Oundle.	—	Jan. 10, 1906
ROTHSCHILD, Hon. Walter...Tring Park, Tring	—	Jan. 10, 1906
SALISBURY, Marquis of, C.B....Hatfield House, Herts.	Nov. 7, 1888	May 2, 1906
SALOMONS, Leopold...Norbury Park, Dorking	—	May 6, 1896
†SANDAY, George H....Highfield, Uxbridge	Mar. 4, 1868	Dec. 10, 1902
SAVILE, Lord, K.C.V.O....Rufford Abbey, Ollerton, Notts.	May 4, 1898	Jan. 30, 1907
†SCHRÖDER, Baron J. H. W....The Dell, Staines	Nov. 3, 1869	April 2, 1890
SHEFFIELD, Sir Berkeley D. G., Bart....Normanby Park, Doncaster	Feb. 7, 1900	Feb. 1, 1905
*SIMONDS, W. Barrow...Abbotts Barton, Winchester	June 19, 1839	Mar. 5, 1890
†SLATER, Sam...Dunscar, Bolton-le-Moors, Lancs.	—	Feb. 7, 1906
SMITH, Eustace Abel...Longhills, Lincoln	June 5, 1889	April 4, 1906
SMITH, G. Murray...Gumley Hall, Market Harborough	Dec. 12, 1888	April 4, 1906
†SMITH, Hon. W. F. D., M.P....3 Grosvenor Place, S.W.	—	Dec. 9, 1891
T SPENCER, Earl, K.G....Althorp Park, Northampton	Dec. 5, 1860	Mar. 3, 1875
‖†STANYFORTH, E. Wilfrid...Kirk Hammerton Hall, York	Feb. 6, 1884	July 31, 1895
STRADBROKE, Earl of, C.B....Henham, Wangford	Feb. 3, 1886	May 2, 1906
STRAUSS, E. A., M.P....Kingston House, Abingdon	—	Mar. 7, 1906
SUFFOLK, Earl of...Charlton Park, Malmesbury	—	May 2, 1906
SUTHERLAND, Duke of, K.G....Stafford House, St. James's, S.W.	Mar. 1, 1882	Dec. 7, 1892
†SUTTON, Martin J....Holme Park, Sonning, Berks.	May 1, 1878	Feb. 1, 1882
†SWINBURNE, Sir John, Bart....Capheaton, Newcastle-on-Tyne	May 1, 1867	May 7, 1890
SWITHINBANK, Harold...Denham Court, Denham, Bucks.	Feb. 4, 1885	Mar. 7, 1906
†TARLETON, Lieut. Alfred H., M.V.O., R.N....Breakspears, Uxbridge	—	July 29, 1903
†THOMPSON, Henry Yates...19 Portman Square, W.	—	Nov. 7, 1894
T†THOROLD, Sir John H., Bart....Syston Park, Grantham	Aug. 5, 1868	May 1, 1889
TOLLEMACHE, Lord...Peckforton Castle, Tarporley	—	Mar. 7, 1906
TOWNLEY, Rev. Charles F....Fulbourn Manor, Cambridge	Mar. 7, 1894	Feb. 7, 1906
TREDEGAR, Viscount...Tredegar Park, Newport, Mon.	—	May 3, 1876
†TRENCH, Col. The Hon. Wm. Le Poer...3 Hyde Park Gardens, W.	Dec. 12, 1888	May 1, 1901
TURBERVILL, Col. J. P....Ewenny Priory, Bridgend	Mar. 5, 1884	July 27, 1892
†TWEEDMOUTH, Lord...Guisachan, Beauly, N.B.	—	July 31, 1889
VAN DE WEYER, Col. V. W. B....New Lodge, Windsor Forest	Aug. 1, 1888	Jan. 10, 1906
WALTER, Col. Arthur F....Bearwood, Wokingham	—	Mar. 6, 1895
†WARREN, Reginald A....Preston Place, East Preston, Worthing	June 3, 1857	June 6, 1894
WATSON, Rev. Wentworth...Rockingham Castle, Uppingham	—	May 4, 1904
WERNHER, Sir Julius, Bart....82 Piccadilly, W.	—	April 13, 1904
WESTMINSTER, Duke of...Eaton Hall, Chester	—	May 30, 1900
†WHARNCLIFFE, Earl of...Wortley Hall, Sheffield	—	May 2, 1906
WHITBREAD, Sam...Southill, Biggleswade. Beds.	June 3, 1879	Mar. 7, 1906
VP†WHITEHEAD, Charles...Barming House, Maidstone	April 1, 1857	Feb. 6, 1889
†WILLIAMS, Henry...Moor Park, Harrogate	Aug. 1, 1883	Mar. 6, 1895
WILLIAMS, Joseph G....Pendley Manor, Tring	—	Jan. 10, 1906
†WILSON, Darcy Bruce...Seacroft Hall, near Leeds	June 3, 1891	Feb. 1, 1905
WOLVERTON, Lord...26, St. James's Place, S.W.	—	May 2, 1906
WYNN, Hon. F. G....Glynllivon Park, Carnarvon	Mar. 4, 1891	Nov. 4, 1903
WYTHES, Ernest J....Copped Hall, Epping, Essex	April 12, 1893	July 29, 1903
P YARBOROUGH, Earl of...Brocklesby Park, Lincolnshire	Aug. 4, 1880	April 4, 1906
†YERBURGH, Robert A....Woodfold Park, Blackburn	—	Nov. 7, 1888
†ZETLAND, Marquis of, K.T....Aske Hall, Richmond, Yorks.	Feb. 4, 1874	May 2, 1894

* Elected a Foundation Life Governor, March 5, 1890. † Life Governor.
T Trustee. P President. VP Vice-President. ‖ Member of Council.

HONORARY MEMBERS OF THE SOCIETY.

("*British Subjects or Foreigners who have rendered exceptional services to Agriculture or Allied Sciences*," *and who have been elected under Bye-law* 8 *as Honorary Members, without payment of subscription.*)

	Date of election
ARISUGAWA, H.I.H. Prince...Tokio, Japan	June 29, 1905
ARNIM, Berndt von...Criewen, Brandenburg, Germany	June 21, 1899
BANG, Dr. B....Professor at the Royal Veterinary College, Copenhagen.	July 31, 1901
CARTUYVELS-VAN-DER-LINDEN, Jules, M.A....215 Rue de la Loi, Brussels	Dec. 11, 1895
CHAUVEAU, Prof. Auguste, M.D., LL.D....10 Avenue Jules Janin, Passy, Paris.	Dec. 6, 1893
CLARKE, Sir Ernest, M.A., F.S.A.... 31 Tavistock Square, London. W.C.	Dec. 6, 1905
DE VOGÜE, Marquis...2 Rue Fabert, Paris (Ordinary Member, June 1, 1892)	June 21, 1899
ELLIOTT, Sir Thomas H., K.C.B...Secretary, Board of Agriculture, 4 Whitehall Place	June 23, 1903
ETZDORF, Landrath von...Elbing, West Prussia	May 30, 1900
EWART, Prof. James Cossar, M.D., F.R.S. ...Regius Professor of Natural History at the University of Edinburgh.	May 1, 1901
FLEISCHMANN, Prof. Wm....Director of the Agricultural Institute of the Royal University of Königsberg	Dec. 12, 1894
KOLHAPUR, H.H. The Raja of, G.C.S.I....Kolhapur (Governor, Feb. 6, 1889)	July 7, 1902
LE COCQ, Señor Alfredo Carlos...Director of the Department of Agriculture, Lisbon	June 23, 1903
LIVEING, Prof. G. D., M.A., F.R.S....The University, Cambridge	Mar. 7, 1894
LOVINK, Herr Hermanus Johannus...Director-General of Agriculture, The Hague, Holland	April 13, 1904
MACDONALD, James, F.R.S.E....Secretary of the Highland and Agricultural Society of Scotland, 3 George IV. Bridge, Edinburgh	June 23, 1903
MCFADYEAN, Prof. Sir John, M.B., B.Sc., C.M....Royal Veterinary College, Camden Town, N.W. (Ordinary Member, Feb. 1, 1893)	May 1, 1901
NOBBE, Dr. J. C. F....Director of the Experimental Station, Tharand, Saxony	May 6, 1896
PASSY, Louis...45 Rue de Clichy, Paris	June 23, 1891
PLUNKETT, The Rt. Hon. Sir Horace Curzon, K.C.V.O.,F.R.S....Vice-President of the Irish Department of Agriculture and Technical Instruction, Dublin	June 23, 1903
PROSKOWETZ, Emanuel Ritter von, sen....Kwassitz, Moravia	Nov. 5, 1890
RAMOS-MEXIA, Senor Don Ezequiel ...Sociedad Rural Argentina, Buenos Aires	July 30, 1902
REID, His Excellency the Hon. Whitelaw...Dorchester House, Park Lane, W.	June 29, 1905
SALMON, Dr. D. E....Chief of the Bureau of Animal Industry, United States Department of Agriculture, Washington	July 31, 1901
SCHERBATOFF, Prince Alexander...President of the Imperial Agricultural Society of Moscow, Russia	Nov. 3, 1897
SIEMONI, Dr. Giovanni Carlo...Director-General of the Department of Agriculture, Rome	June 23, 1903
THIEL, Dr. H....Privy Councillor, and Director of the Department of Agriculture, 17 Lutherstrasse, Berlin	Aug. 1, 1883
TISSERAND, Eugène...Ancien Directeur de l'Agriculture, 17 Rue du Cirque, Paris	Aug. 1, 1883
VASSILLIERE, Léon...Director of Agriculture at the Ministry of Agriculture, Paris	June 23, 1903

SUMMARY OF MEMBERS ON REGISTER, DECEMBER 31, 1906.

1 **Foundation Life Governor** (Member elected before the granting of the Charter on March 26, 1840).
155 **Governors** paying an annual subscription of 5*l.*
93 **Life Governors** who have compounded for their annual subscriptions.
6,189 **Members** paying an annual subscription of 1*l.*
3,132 **Life Members** who have compounded for their annual subscriptions.
30 **Honorary Members.**

9,600, Total number of Governors and Members at December 31, 1906.

Royal Agricultural Society of England.

INCREASED ANNUAL SUBSCRIPTIONS AND DONATIONS

Received and Promised by Governors, Members, and others interested in the Society's work.

Amount of Subscriptions Promised to Date, £567 3s.

ANNUAL SUBSCRIPTIONS.

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Mr. G. L. Venables	1	0	0
*Mr. E. W. Voelcker	1	0	0
Prince Blücher von Wahlstatt	1	0	0
Princess Blücher von Wahlstatt	1	0	0
Sir H. Wake, Bart.	1	0	0
Mr. E. F. Walesby	1	0	0
Mr. J. C. Walker	1	0	0
Mr. James Watt	1	0	0
*Mr. Jonas M. Webb	1	0	0
*Earl of Westmorland	1	0	0
*Mr. J. M. White	1	0	0
Mr. T. P. Wilkes	1	0	0
Mr. Samuel Williamson	1	0	0
Marquis of Winchester	1	0	0
Mr. Thomas Winter	1	0	0
	£567	3	0

* Life Governor or Life Member.

DONATIONS.

	£	s.	d.
The Goldsmiths' Company	500	0	0
The Mercers' Company	105	0	0
"Anonymous"	100	0	0
The London and Westminster Bank, Ltd.	50	0	0
Sir Oswald Mosley, Bart.	50	0	0
Mr. Clement Stephenson	35	14	0
London and County Banking Co., Ltd.	31	10	0
Sir A. C. Stepney, Bart.	25	0	0
Surveyors' Institution	21	0	0
National and Provincial Bank, Ltd.	21	0	0
Merchant Taylors' Company	21	0	0
Sir Charles Hamilton, Bart.	10	10	0
Rt. Hon. A. J. Balfour, M.P.	10	10	0
Mr. E. H. Hill.	10	0	0
Mr. E. R. Pratt	8	0	0
Mr. Albert Buck	5	0	0
Caius College, Cambridge	5	0	0
Mr. Howard Gilliat	5	0	0
Mr. James Gould	5	0	0
Mr. Louis Paine	3	0	0
Mr. William Holder	2	2	0
Mr. C. Pelham Lane	2	2	0
Mr. Norman McMullen	2	2	0
Wensleydale Blue-faced Sheep Association.	2	2	0
Trustees of the late Dr. Corbett	2	0	0
Mr. Alfred Hewlett	2	0	0
Mr. W. A. Butcher	1	1	0
Mr. J. P. King	1	1	0
Mr. Charles Whitaker.	1	1	0
Mr. George Ballard	1	0	0
Mr. R. M. Danks	1	0	0
Mr. R. H. P. Hutchinson	1	0	0
Mr. William S. Stowell	0	10	6
	£1,041	5	6

Dr. BALANCE-SHEET,

Corresponding figures for 1905.		£ s. d.	£ s. d.	£ s. d.
£				
37,000	To HAREWOOD HOUSE DEBENTURE STOCK .			37,000 0 0
	To SUNDRY CREDITORS—			
1,931	Sundry Creditors and outstanding		1,908 13 9	
70	Subscriptions received in 1906 in advance . .		110 2 0	
—	Show Receipts received in 1906 and belonging to 1907		848 1 3	
				2,866 17 0
7,785	To LOANS secured by a Second Mortgage on Harewood House			7,785 0 0
—	To LOAN from Bankers			3,000 0 0
	To AVAILABLE CAPITAL—			
4,399	Capital at December 31, 1905		2,627 16 0	
	BALANCE FROM SHOW FUND—			
—	Profit on Show at Derby	2,028 8 4		
—	Contribution from Ordinary Income . .	2,000 0 0		
			4,028 8 4	
413	Donations towards the Society's Funds . . .		1,038 6 0	
186	Life Compositions received in 1906		824 0 0	
—	Excess amount realised on Timber Sales . . .		219 0 4	
4,998			8,737 10 8	
1,484	*Less* Deficiency on Ordinary Income and			
430	Expenditure Account		1,281 7 11	
1,914				
3,084			7,456 2 9	
	DEPRECIATIONS written off, viz.:—			
153	Fixtures	141 15 5		
107	Furniture	101 0 8		
16	Machinery	14 2 10		
131	Show Plant	103 19 5		
50	Buildings at Woburn	50 0 0		
457			410 18 4	
2,627				7,045 4 5
27,557	To SUBSCRIPTIONS AND DONATIONS TO PERMANENT SITE FUND			27,557 7 0

[*Note.*—In addition to the Invested Assets, as stated in this Balance-sheet, the Society holds in its corporate name 8,126*l.* 8*s.* 2*d.* Consols., representing a Legacy of 9,000*l.* received in 1896 under the will of the late Mr. E. H. Hills. The income arising therefrom is, under the will, to be applied in the investigation of the value and uses of the rarer forms of ash in the cultivation of crops; and the Trust will be administered under the Charitable Trusts Acts.]

£76,971		£85,254 8 5

THOMAS McROW, *Secretary.*

WELTON, JONES & CO., *Accountants.*

DECEMBER 31, 1906.

Cr.

rrespond-g figures or 1905 £		£ s. d.	£ s. d.
37,000	By HAREWOOD HOUSE at cost		37,000 0 0
	[*Note.*—Since its original purchase, the property has considerably appreciated in value.]		
1,145	By 1,100*l.* HAREWOOD HOUSE 2½ per cent. DEBENTURE STOCK (part of a total of 37,000*l.* Stock) at cost		1,144 17 4
—	By LEASE OF 16 BEDFORD SQUARE		3,000 0 0
	By FIXTURES AT HAREWOOD HOUSE—		
	Value at December 31, 1905	1,890 5 9	
	Less Depreciation at 7½ per cent.	141 15 5	
		1,748 10 4	
	Added during 1906	11 3 6	
1,890			1,759 13 10
	By FURNITURE—		
	Value at December 31, 1905	2,296 17 4	
	Less Sales	11 0 0	
		2,285 17 4	
	Less Depreciation	101 0 8	
2,297			2,184 16 8
1,500	By PICTURES (500*l.*) and BOOKS (1,000*l.*)		1,500 0 0
	By MACHINERY—		
	Value at December 31, 1905	141 8 6	
	Less Depreciation at 10 per cent.	14 2 10	
141			127 5 8
	By SHOW PLANT—		
	Value at December 31, 1905	2,483 16 3	
	Less Sales	404 8 0	
		2,079 8 3	
	Less Depreciation at 5 per cent.	103 19 5	
2,484			1,975 8 10
	By BUILDINGS FOR POT EXPERIMENTS AT WOBURN—		
	As per Account at December 31, 1905	700 0 0	
	Less Depreciation.	50 0 0	
700			650 0 0
389	By SUNDRY DEBTORS		435 5 0
1,500			
249			
	By CASH AT BANKERS AND IN HAND—		
—	Reserve Fund	7,609 14 8	
37	Ordinary Account	248 17 9	
82	In Hand	61 1 8	
			7,919 14 1
27,557	By SHARES IN PARK ROYAL LIMITED—		
	15,000 Shares of 1*l.* each, at cost		27,557 7 0
	[*Note.*—This has no relation to the present value of the Shares, which is dependent on the realisation of Park Royal.]		
£76,971			£85,254 8 5

Examined, audited, and found correct, this 14th day of February, 1907.

JONAS M. WEBB.
HUBERT J. GREENWOOD,
NEWELL P. SQUAREY,
} *Auditors on behalf of the Society.*

STATEMENT OF ORDINARY INCOME

The Expenditure in this account includes not only cash payments

Income

Corresponding figures for 1905.		£ s. d.	£ s. d.
£	ANNUAL SUBSCRIPTIONS:—		
464	*Governors*: Subscriptions for 1906	710 13 0	
	Received in 1905, but belonging to 1906	70 4 0	
102	*Members*:		
	Subscriptions for 1906	5,747 9 0	
110	Subscriptions for 1906 (additional)	179 3 0	
85	Subscriptions for previous years	71 0 0	
	LIFE GOVERNORS AND MEMBERS:—		
143	Annual Contributions	250 5 0	7,028 14 0
6,263	MISCELLANEOUS:—		
—	Interest on Daily Balances	228 1 7	
—	Income on Investments	26 2 6	
74	Sales of Pamphlets, Diagrams, &c.	77 7 10	
113	Sales of Text Book	138 5 3	
—	Letting of Council and Committee Rooms	19 19 0	489 16 2
187	Rent of 12 Hanover Square	313 10 0	
	Less Rent paid	313 10 0	
6,450			7,518 10 2
1,484	Debit Balance carried to Balance-sheet		1,281 7 11
£7,934			£8,799 18 1

THOMAS McROW, *Secretary.*
WELTON, JONES, & CO., *Accountants.*

but all liabilities in connection with the year's transactions.

Expenditure.

Corresponding figures for 1905		£ s. d.	£ s. d.
	GENERAL ADMINISTRATION:—		
£ 2,007	Salaries of Official Staff	1,779 10 0	
190	Pensions to Officials	190 0 0	
82 } 403 }	Professional Charges:—Auditors' Fees	56 14 0	
1,860	Rent, Rates, Taxes, Insurance, and House Expenses	1,787 0 2	
2	Binding and Purchase of Books	14 15 8	
521	Printing and Stationery	403 10 10	
145	Postage and Telegrams	186 18 1	
36	Carriage of Parcels and Travelling Expenses	34 17 10	
46	Advertising and Miscellaneous Office Expenses	61 2 5	
314	Interest on Loans	322 14 8	
5,606			4,837 3 8
	JOURNAL OF THE SOCIETY, VOL. 67:—		
400	Printing, Binding, &c.	420 0 0	
194	Postage, Packing, and Delivery	186 13 4	
225	Editing, Literary Contributions, &c.	165 0 0	
—	Illustrations	30 0 0	
819		801 13 4	
		£ s. d.	
104	*Less* Sales (Vol. 66 and earlier)	85 12 5	
115	Advertisements (Vol. 67)	150 0 0	235 12 5
219	*Less* Credit Balance { Printing, &c.	84 16 3	566 0 11
	from Vol. 66 { Advertisements	41 8 11	126 5 2
600			439 15 9
75	**ELEMENTS OF AGRICULTURE:—**		
183	Binding Text Book		26 5 0
	PAMPHLETS:—		
—	Printing Report on Trials of Suction Gas Plants		33 8 6
	LABORATORY:—		
614	Salaries, Wages, &c.		614 14 6
18			
596			
	OTHER SCIENTIFIC DEPARTMENTS:—		
254	Consulting Botanist's Salary and Expenses	250 19 2	
200	Zoologist's Salary	200 0 0	
200	Grant to Royal Veterinary College	200 0 0	
3	Medals for Proficiency in Cattle Pathology	2 12 3	
657			653 11 5
	EXAMINATION FOR NATIONAL DIPLOMA IN AGRICULTURE:—		
169	Honoraria and Expenses of Examiners	169 16 5	
16	Travelling Expenses of Officials	17 9 0	
27	Hotel Expenses of Examiners and Officials	26 14 10	
23	Printing, Stationery, and Advertising	25 8 0	
17	Writing Diplomas and Gold Medal	21 6 6	
—	Secretary's Salary	50 0 0	
252		310 14 9	
92	*Less* Entry Fees received and Sales of Examination Papers	86 17 0	
160		223 17 9	
80	*Less* Amount received from Highland and Agricultural Society	101 10 6	
80			122 7 3
	EXAMINATION FOR NATIONAL DIPLOMA IN DAIRYING:—		
86	Milk, Cream, and Appliances for Examination	20 2 9	
55	Fees to Examiners	45 13 0	
17	Maintenance and Travelling Expenses	10 18 9	
5	Printing and Postage	8 13 0	
163		85 7 6	
26	*Less* Deposits forfeited, and Sales of Examination Papers	12 15 6	
137			72 12 0
—	Contribution to Show Fund		2,000 0 0
£7,934			£8,799 18 1

Examined, audited, and found correct, this 14th day of February, 1907.

JONAS M. WEBB,
HUBERT J. GREENWOOD,
NEWELL P. SQUAREY,
} *Auditors on behalf of the Society.*

STATEMENT OF RECEIPTS AND EXPEN-

JUNE 27 TO

Receipts.

Corresponding figures for 1905. £		£ s. d.	£ s. d.
—	Subscription from Derby Local Committee		2,000 0 0
	FEES FOR ENTRY OF IMPLEMENTS:—		
3,957	Implement Exhibitors' Payments for Shedding	5,708 13 0	
108	Non-Members' Fees for Entry of Implements	194 0 0	
57	Fees for Entry of "New Implements"	63 0 0	
4,122			5,965 13 0
	FEES FOR ENTRY OF LIVE STOCK:—		
1,841	By Members:—1,963 Entries @ 1*l.*	1,963 0 0	
99	87 Post Entries @ 30*s.*	130 10 0	
72	41 Late Entries @ 2*l.*	82 0 0	
15	43 Substituted @ 5*s.*	10 15 0	
2,027			2,186 5 0
366	By Non-Members:—218 Entries @ 2*l.*	436 0 0	
45	24 Post Entries @ 50*s.*	60 0 0	
36	8 Late Entries @ 3*l.*	24 0 0	
2	2 Substituted at 10*s.*	1 0 0	
449			521 0 0
50	160 Entries @ 5*s.*		40 0 0
689	Fees for Horse Boxes and Stalls		877 0 0
	FEES FOR ENTRY OF POULTRY:—		
26	By Members:—206 Entries @ 2*s.* 6*d.*	25 15 0	
3			
156	By Non-Members:—598 Entries @ 5*s.*	149 10 0	
10	9 Post Entries @ 10*s.*	4 10 0	
195			179 15 0
	OTHER ENTRY FEES:—		
65	Fees for Entry of Produce		64 15 0
16	Fees for Entry in Horse-shoeing Competition		21 5 0
—	Fees for Entry in Horse-jumping Competition		36 0 0
	CATALOGUE:—		
		£ s. d.	
2	Extra Lines for Particulars of Implement Exhibits	15 7 0	
7	Woodcuts of "New Implements"	6 6 3	
136	Advertising in Catalogue	182 16 3	
20	Sales of Implement Section of Catalogue (including bound copies)	22 1 9	
364	Sales of Combined Catalogue	642 4 0	
12	Sales of Programmes	1 3 6	
541		869 18 9	
24	*Less* Commission on Sales	26 18 3	
517			843 0 6
	MISCELLANEOUS RECEIPTS:—		
115	Amount received from Refreshment Contractors	465 0 0	
—	Rent of Railway Offices	126 0 0	
32	Premium for Cloak Room	35 0 0	
10			
—	Rent for Board of Agriculture Pavilion	30 0 0	
8	Premium for Motor Garage	14 12 6	
23	Miscellaneous	5 9 0	
188			676 1 6
£8,318	Carried forward		£13,410 15 0

Expenditure.

Corresponding figures for 1905. £		£ s. d.	£ s. d.	£ s. d.
	COST OF ERECTION OF SHOWYARD:—			
	Transferring Society's Plant from Park Royal to Derby		1,233 16 5	
	Fencing round Showyard		764 18 2½	
	Erection of Implement Shedding		1,415 8 2	
	Erection of Stock Shedding		2,919 11 1	
	Erection of Dairy		222 15 6½	
	Erection of Fodder Shed, Office, &c.		84 16 9	
	Erection of Grand Stand, &c.		542 3 0	
	Erection of Horse-shoeing Shed		91 17 3	
	Various Offices:—Lavatories, Stewards' Stables, and extension to Main Entrance		1,213 7 3½	
	Printing Signs and fixing do., providing and fixing Judging Hurdles, erecting Temporary Exit Sheds, and constructing Platform in front of Entrances		165 0 0	
	Insurance		7 2 1	
	Ironmongery		11 13 9	
	Erection of Gas Suction Plant Shed		110 1 5½	
	Forestry Exhibition		100 11 8	
	Board of Agriculture Pavilion		90 15 0	
	Fire Station		37 15 3½	
	Osmaston Road Entrance		25 10 0	
	Hire of Canvas, Felt, &c.		1,290 7 6	
	General Labour, &c. (including Society's Clerk of Works		414 11 4	
			10,742 1 9½	
	Less 6½ per cent. on 7,101*l.* 0*s.* 4*d.* (as per contract)	461 11 4½		
	81 Flag Poles at 10*s.*	40 10 0		
			502 1 4½	
3,737				10,240 0 5
	Salaries:—Surveyor		250 0 0	
	Assistant Director		250 0 0	
2,000				500 0 0
	PRINTING:—			
347	Printing of Prize Sheets, Entry Forms, Admission Orders, Circulars to Exhibitors, Prize Cards, Tickets, and Miscellaneous		528 10 5	
60	Programmes for Members		69 6 6	
19	Plans of Showyard		24 16 2	
25				
448	Printing of Catalogues		617 17 9	
71	Binding of Catalogues		99 8 2	
11	Carriage of Catalogues to Showyard		29 11 10	
70	Printing Awards		73 18 0	
18	Programmes of Jumping Competitions		18 0 0	
1,069				1,461 8 10
	ADVERTISING:—			
90	Advertising Closing of Entries in Newspapers		100 17 0	
759	Advertising Show in Newspapers		128 3 4	
9	Bill Posting		500 0 0	
133	Printing of Posters and Placards		192 12 3	
47	Press Visit, &c., before Show		39 9 4	
6				961 1 11
1,044	**POSTAGE, CARRIAGE, &C.:—**			
96	General Postage		71 9 2	
33	Postage of Tickets to Members		33 13 2	
5	Carriage of Luggage		10 16 1	
134				115 18 5
5,100	**AMOUNT OF PRIZES AWARDED** (for details, see page xxii.)			3,768 15 0
604	**COST OF FORAGE FOR LIVE STOCK:—** Hay, 182*l.* 2*s.* 10*d.*; Straw, 349*l.* 1*s.* 3*d.*; Green Food, 96*l.* 17*s.* 9*d.*; Insurance, 2*l.* 5*s.* 9*d.*; Cartage, 17*l.* 1*s.* 5*d.*			647 9 0
441	**JUDGES' FEES AND EXPENSES:—** Judges of Implement Trials, 46*l.* 4*s.* 11*d.*; Miscellaneous Implements, 28*l.* 17*s.* 6*d.*; Judges of Horses, 65*l.* 17*s.* 5*d.*; Cattle, 129*l.* 14*s.* 10*d.*; Sheep, 81*l.* 15*s.* 4*d.*; Pigs, 21*l.* 4*s.* 6*d.*; Poultry, 11*l.* 18*s.* 10*d.*; Butter, 4*l.* 5*s.* 6*d.*; Cheese, 14*l.* 10*s.* 6*d.*; Cider and Perry, 10*l.* 4*s.* 8*d.*; Wool, 4*l.* 4*s.* 6*d.*; Horse-shoeing, 26*l.* 18*s.* 0*d.*; Luncheons, 10*l.* 1*s.* 0*d.*			455 17 6
£14,129	Carried forward			£18,150 11 1

Receipts (*contd.*).

Corresponding figures for 1905. £		£ s. d.	£ s. d.
8,318	Brought forward		13,410 15 0
	ADMISSIONS TO SHOWYARD:—		
343	Wednesday, June 27, @ 5*s.*	685 7 9	
949	Thursday, June 28, @ 2*s.* 6*d.*	2,991 10 3	
640	Friday, June 29, @ 1*s.*	2,018 14 6	
285	Saturday, June 30, @ 1*s.*	1,992 10 11	
40	Day Tickets	502 7 5	
7	Season Tickets	95 19 6	
2,264			8,286 10 4
	ENTRANCES TO HORSE RING:—		
184	Thursday, June 28	266 2 0	
81	Friday, June 29	161 15 0	
22	Saturday, June 30	138 11 0	
119	Tickets sold for Reserved Enclosure	239 10 0	
7			805 18 0
413			
	DAIRY:—		
61	Sales of Produce at Dairy		50 18 11
241	Auction Sales in Showyard and Share of Commission		324 11 0
7,280	*Debit Balance on Show*		

STATEMENT OF PRIZES AWARDED:—

		£ s. d.	£ s. d.
1,873	Horses	1,830 0 0	
2,747	Cattle	2,092 15 0	
1,563	Sheep	1,357 10 0	
424	Pigs	441 5 0	
285	Poultry	181 15 0	
115	Cheese and Butter	90 0 0	
40	Cider and Perry	40 0 0	
53	Wool	51 0 0	
16	Horse-shoeing	16 0 0	
175	Horse-jumping	167 15 0	
53			
40	Contribution to Bee Department	40 0 0	
7,384		6,308 0 0	
		£ s. d.	
1,248	*Less* Prizes given by various Societies, &c.	1,738 10 0	
1,000	Prizes given by Derby Local Committee	793 0 0	
—	Horse-jumping (Consolation Prizes)	7 15 0	
36			2,539 5 0
2,284			
5,100			£3,768 15 0
£18,577			£22,878 13 3

Examined, audited, and found correct, this 5th day of December, 1906.

THOMAS McROW, *Secretary.*
WELTON, JONES & Co., *Accountants.*

JONAS M. WEBB,
NEWELL P. SQUAREY,
} *Auditors on behalf of the Society.*

Expenditure (*contd.*).

Corresponding figures for 1905.		£ s. d.	£ s. d.
£ 14,129	Brought forward		18,150 11 1
15	Badges for Judges and other Officials		49 10 0
32	Rosettes		42 3 9
	GENERAL ADMINISTRATION :—		
66	*Stewards* :—House, 13*l.* ; Living, 38*l.* 10*s.* 1*d.* ; Personal and Railway Expenses, 18*l.* 10*s.* 2*d.*	70 0 3	
75	*Assistant Stewards* :—Personal and Railway Expenses.	49 8 5	
58	*Official Staff* :—Extra Clerks, 62*l.* 17*s.* 9*d.* ; Lodgings, 42*l.* ; Maintenance of Clerks, 36*l.* 15*s.* 0*d.* ; Travelling Expenses, 9*l.* 19*s.* 5*d.* ; Secretary Expenses, 40*l.* 7*s.* 0*d.*	191 19 2	
76	*Finance Office* :—Superintendent of Turnstiles, 10*l.* 10*s.* ; Grand Stand Men, 15*l.* 15*s.* 7*d.* ; Turnstile Men, 37*l.* ; Bank Clerks, 16*l.* 13*s.* 0*d.*	79 18 7	
45	*Awards Office* :—Clerks, 32*l.* 9*s.* 2*d.* ; Awards Boys, 1*l.* 3*s.* 4*d.*	33 12 6	
403			424 18 11
	General Management :—		
72	Foreman and Assistant Foremen	47 6 11	
325	Yardmen and Foddermen	78 11 0	
70	Door and Gate Keepers	50 15 5	
53	Carriage and Horse Hire	13 9 0	
83	*Veterinary Department* :—Veterinary Inspectors	108 4 2	
87	*Engineering Department* :—Consulting Engineer and Assistants, 76*l.* 15*s.* 0*d.* ; Wages to Workmen, 13*l.* 9*s.* 11*d.* ; House, 6*l.* 6*s.* 0*d.*	96 10 11	
427	*Police, &c.* :—Metropolitan Police, 470*l.* 0*s.* 5*d.* ; Commissionaires, 20*l.* 8*s.* 11*d.*	490 9 4	
1,117			885 6 9
252	*Dairy* :—Staff, 83*l.* 9*s.* 4*d.* ; Milk, 42*l.* 6*s.* 8*d.* ; Ice, 13*l.* 10*s.* 0*d.* ; Utensils, 61*l.* 0*s.* 11*d.* ; Salt, 1*l.* 16*s.* 0*d.* ; Miscellaneous Payments, 3*l.* 2*s.* 9*d.* ; Butter Tests, 14*l.* 6*s.* 3*d.* ; Milk Analyses, 15*l.* 6*s.* 6*d.* ; Carriage, 1*l.* 1*s.* 6*d.*		235 19 11
31	*Poultry* :—Superintendent, 10*l.* 10*s.* 7*d.* ; Penning, Attendants, and Food, 20*l.* 15*s.* 6*d.* ; Carriage, 10*l.* 11*s.* 4*d.*		41 17 5
32	*Horse-shoeing* :—Hire of Forges, 17*l.* 9*s.* 6*d.* ; Nails, 1*l.* 18*s.* 6*d.* ; Gratuities, 5*l.* 2*s.* 6*d.* ; Refreshments, 1*l.* 3*s.* 9*d.*		25 14 3
10	*Produce* :—Analyses of Cider		18 12 8
	GENERAL SHOWYARD EXPENSES :—		
	Military Bands	141 5 0	
	St. John Ambulance Association	50 0 0	
	Official Luncheons	52 18 5	
	Royal Pavilion : Furnishing	82 5 0	
	Floral Decorations	10 0 0	
	Bath Chairs	3 3 9	
	Telephone Extension	20 16 5	
	Education Exhibit	22 16 6	
	Laying on Gas Mains	110 14 1	
	Hire and Erection of Horticultural Tent	73 17 11	
	Carriage of Sleepers	25 12 8	
	Tan and Ashes	14 19 2	
	Hire of Chairs	38 0 0	
	Medals	14 15 0	
	Hire of Safes, 1*l.* 10*s.* ; Hire of Stoves, 1*l.* 10*s.* ; Towels, 10*l.* 13*s.* 6*d.* ; Blinds, 9*l.* 18*s.* 6*d.* ; Cord, 3*l.*	26 12 0	
	Telegraph Extension	18 13 10	
	Miscellaneous Payments	22 5 7	
512			728 15 4
	Trials of Suction Gas Plants		246 14 10
	Credit Balance		2,028 8 4
2,044			
£18,577			£22,878 13 3

Actual profit to the Society on the Derby Show	£2,028 8 4
Contribution from Ordinary Funds of the Society to the Show Fund	2,000 0 0
Balance carried to Reserve Fund	£4,028 8 4

Table showing the Number of GOVERNORS and MEMBERS in each year from the Establishment of the Society.

Year ending with Show of	President of the Year	Governors		Members			Total
		Life	Annual	Life	Annual	Honorary	
1839	3rd Earl Spencer	—	—	—	—	—	1,100
1840	5th Duke of Richmond	86	189	146	2,434	5	2,860
1841	Mr. Philip Pusey	91	219	231	4,047	7	4,595
1842	Mr. Henry Handley	101	211	328	5,194	15	5,849
1843	4th Earl of Hardwicke	94	209	429	6,155	15	6,902
1844	3rd Earl Spencer	95	214	442	6,161	15	6,927
1845	5th Duke of Richmond	94	198	527	5,899	15	6,733
1846	1st Viscount Portman	92	201	554	6,105	19	6,971
1847	6th Earl of Egmont	91	195	607	5,478	20	6,391
1848	2nd Earl of Yarborough.	93	186	648	5,387	21	6,335
1849	3rd Earl of Chichester	89	178	582	4,643	20	5,512
1850	4th Marquis of Downshire	90	169	627	4,356	19	5,261
1851	5th Duke of Richmond	91	162	674	4,175	19	5,121
1852	2nd Earl of Ducie	93	156	711	4,002	19	4,981
1853	2nd Lord Ashburton	90	147	739	3,928	19	4,923
1854	Mr. Philip Pusey	88	146	771	4,152	20	5,177
1855	Mr. William Miles, M.P.	89	141	795	3,838	19	4,882
1856	1st Viscount Portman	85	139	839	3,896	20	4,979
1857	Viscount Ossington	83	137	896	3,933	19	5,068
1858	6th Lord Berners	81	133	904	4,010	18	5,146
1859	7th Duke of Marlborough	78	130	927	4,008	18	5,161
1860	5th Lord Walsingham	72	119	927	4,047	18	5,183
1861	4th Earl of Powis	84	90	1,113	3,328	18	4,633
1862	H.R.H. The Prince Consort / 1st Viscount Portman	83	97	1,151	3,475	17	4,823
1863	Viscount Eversley	80	88	1,263	3,735	17	5,183
1864	2nd Lord Feversham	78	45	1,343	4,013	17	5,496
1865	Sir E. C. Kerrison, Bart., M.P.	79	81	1,386	4,190	16	5,752
1866	1st Lord Tredegar	79	84	1,395	4,049	15	5,622
1867	Mr. H. S. Thompson	77	82	1,388	3,903	15	5,465
1868	6th Duke of Richmond	75	74	1,409	3,888	15	5,461
1869	H.R.H. The Prince of Wales, K.G.	75	73	1,417	3,864	17	5,446
1870	7th Duke of Devonshire.	74	74	1,511	3,764	15	5,438
1871	6th Lord Vernon	72	74	1,589	3,896	17	5,648
1872	Sir W. W. Wynn, Bart., M.P.	71	73	1,655	3,953	14	5,766
1873	Earl Cathcart	74	62	1,832	3,936	12	5,916
1874	Mr. Edward Holland	76	58	1,944	3,756	12	5,846
1875	Viscount Bridport	79	79	2,058	3,918	11	6,145
1876	2nd Lord Chesham	83	78	2,164	4,013	11	6,349
1877	Lord Skelmersdale	81	76	2,239	4,073	17	6,486
1878	Col. Kingscote, C.B., M.P.	81	72	2,328	4,130	26	6,637
1879	H.R.H. The Prince of Wales, K.G.	81	72	2,453	4,700	26	7,332
1880	9th Duke of Bedford	83	70	2,673	5,083	20	7,929
1881	Mr. William Wells	85	69	2,765	5,041	19	7,979
1882	Mr. John Dent Dent	82	71	2,849	5,059	19	8,080
1883	6th Duke of Richmond and Gordon	78	71	2,979	4,952	19	8,099
1884	Sir Brandreth Gibbs	72	72	3,203	5,408	21	8,776
1885	Sir M. Lopes, Bart., M.P.	71	69	3,356	5,619	20	9,135
1886	H.R.H. The Prince of Wales, K.G.	70	61	3,414	5,569	20	9,134
1887	Lord Egerton of Tatton	71	64	3,440	5,387	20	8,982
1888	Sir M. W. Ridley, Bart., M.P.	66	56	3,521	5,225	16	8,884
1889	Her Majesty Queen Victoria	73	58	3,567	7,153	15	10,866
1890	Lord Moreton	122	58	3,846	6,941	17	10,984
1891	2nd Earl of Ravensworth	117	60	3,811	6,921	19	10,928
1892	Earl of Feversham	111	69	3,784	7,066	20	11,050
1893	1st Duke of Westminster, K.G.	107	74	3,786	7,138	21	11,126
1894	Duke of Devonshire, K.G.	113	73	3,798	7,212	22	11,218
1895	Sir J. H. Thorold, Bart.	120	80	3,747	7,179	23	11,149
1896	Sir Walter Gilbey, Bart.	126	83	3,695	7,253	23	11,180
1897	H.R.H. The Duke of York, K.G.	126	83	3,705	7,285	24	11,223
1898	Earl Spencer, K.G.	121	79	3,687	7,182	25	11,094
1899	Earl of Coventry	116	75	3,656	7,009	23	10,879
1900	H.R.H. The Prince of Wales, K.G.	111	71	3,628	6,832	24	10,666
1901	Earl Cawdor	102	70	3,564	6,338	27	10,033
1902	H.R.H. Prince Christian, K.G.	100	69	3,500	5,955	26	9,650
1903	H.R.H. The Prince of Wales, K.G.	99	62	3,439	5,771	27	9,398
1904	Earl of Derby, K.G.	96	68	3,375	5,906	32	9,477
1905	Lord Middleton	95	72	3,270	5,808	31	9,276
1906	Mr. F. S. W. Cornwallis.	94	155	3,132	6,189	30	9,600

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

Abstracts from the Proceedings of the Council.

WEDNESDAY, JANUARY 10, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

The late Mr. Howard P. Ryland.

The PRESIDENT said that since their last meeting they had lost by death an active Member of the Council, Mr. Howard P. Ryland, the representative of Warwickshire who died on December 28 last. Mr. Ryland was elected a Member of the Council in 1894, and since that date he had rendered valuable services to the Society as a Member of many of its committees, including the Chemical, Stock Prizes, Implement, and Showyard Works Committees; as Steward either of Implements or Live Stock, at many of the Society's Shows; and as Steward of Forage at Birmingham in 1898. His death would be greatly regretted by his colleagues on the Council.

Resignation of Mr. William Frankish.

The PRESIDENT said he regretted also to announce that he had received a letter from Mr. William Frankish resigning his seat as a Member of the Council. Mr. Frankish had occupied this position for the exceptionally long period of thirty years, he having joined the Council in 1875. He had been an active Member of some of the most important of the Society's committees, including the Finance Committee, and throughout the whole of his long period of membership he had attended the meetings of those committees and of the Council with unfailing regularity. He had acted as Chairman of the Implement Committee since the death of the late Mr. Hemsley, in 1888, and in that capacity, as well as Steward of Finance and Steward of other departments of the Shows, his services had been of the greatest value to the Society. They could only express their great regret that Mr. Frankish felt that the time had now come for him to relinquish active participation in the Society's work. In accepting his resignation he was sure that it would be their wish that he should convey to Mr. Frankish an expression of their great regret at his retirement, with the assurance of their goodwill and grateful recollection of his long, untiring, and valuable services to the Society. (Hear, hear.)

Finance Committee.

Mr. ADEANE (Chairman) reported that the Committee had considered the report for the year 1904-5 of the Directors of Park Royal, Limited, viz., Lord Middleton, Sir Walter Gilbey, Sir Nigel Kingscote, and Mr. Percy Crutchley, which was to be presented to the ordinary general meeting of the Company on January 10, 1906. The Report contained the following paragraph:—

> The Directors who would in the ordinary course retire at this meeting in accordance with the Articles of Association are Lord Middleton and Mr. Percy Crutchley. Having regard, however, to the decision of the Royal Agricultural Society (which is the registered holder of all but seven of the 15,000 shares of the Company) to hold its Show of 1906 elsewhere than at Park Royal, and to put the Company's estate up for sale in the course of next summer, it does not appear to the present Directors of the Company that any useful purpose would be served by their continuing in office. They desire therefore to tender their resignations as Directors as soon as it may be convenient to the Society to make other arrangements for the control of the Company's affairs.

The Committee desired to place on record their appreciation of the services rendered by the Directors who had expressed their wish to retire, and they recommended that the names of Mr. F. S. W. Cornwallis, Mr. C. R. W. Adeane, Mr. Richardson Carr, and Sir Richard Cooper be submitted to the General Meeting of Park Royal, Limited, to be held on the 10th instant, for election as Directors of the Company ; that the shareholders who hold shares on behalf of the Society be requested to vote for their election accordingly ; and that it be an instruction to the Directors to take the necessary steps for the sale of Park Royal.

The Committee recommended that an estimate of the Society's receipts and expenditure for the current year be submitted to all the Committees at their meetings in February next, and that any grants required be submitted to the Finance Committee for their consideration before presentation to the Council. They further recommended that no additional expenditure should be incurred by a committee without the consent of the Council, the proposed increase having been first brought before the Finance Committee.

Mr. ADEANE, in presenting for the first time a report from the Finance Committee, of which he had been elected Chairman, asked for the kind indulgence of the Members of the Council, because he was new to the Council, and new to the work of the Finance Committee. He felt very much the responsibility he was undertaking in becoming Chairman of the Committee, and he would not have undertaken the work had he not been assured by the Members and by Sir Nigel Kingscote, who had so long presided over the Committee, that they would give him their hearty support. He was doubtful of his capacity to do the work considering the difficulties that lay before them ; but he was perhaps of an optimistic nature, and he hoped that somehow they would be able to struggle through. He could, however, assure the Council that he would do his utmost, with the help of the Finance Committee, to put the Society on a sound financial basis.

He thought that in this, the first year of the new Council, they would all wish that some careful financial statement should be laid before them, and he hoped they would agree that the plainer they made their position, the more sympathy they would get from the public outside. That was the unanimous feeling of the Finance Committee, and they proposed, as soon as they were able to do so, to lay such a statement before the Council. They hoped to lay the balance-sheet for the year 1905 before the Council at their meeting in February, and also to submit for their sanction an estimate of the expenditure for the coming year. He thought it was most important that they should know where they were going, how much they were spending, and how much money they had with which to meet their estimated expenditure. He hoped that when once that estimated expenditure had been passed, no increase would be permitted except by leave of the Council, any proposed increase having first been brought before the Finance Committee. He did not think that the Finance Committee wished to tyrannise over the other Committees, but if they were to be responsible for the finances of the Society—and they wished to accept full responsibility—the Committee must have some control, at any rate as regards the giving of advice to the Council.

He did not propose to go into any detailed figures that day, but with regard to the appeal which the Finance Committee were now making through the Members of the Council, he thought he should mention one point, because the financial position of the Society was a serious one. It was very difficult for them to appraise property the value of which would not be known until it came to the hammer ; but roughly he thought they might take it as a basis that their assets balanced their liabilities. This being so, they had no reserve. At one time, they had 30,000*l*., but this had all been expended. The future of the Society, therefore, rested entirely upon the goodwill of agriculturists throughout England and Wales. He thought it would be a step forward if that were clearly realised. He was of opinion that the generous subscriptions which had already been

announced would prove a great encouragement. He believed that if an appeal for further support were organised in every county in England and Wales it would have very good results, and he quite hoped that by the end of the financial year the Society would be placed on a really sound basis. So far as he could see, the Society could not continue to exist without an income of at least 10,000*l.* a year. At present they received something over 6,000*l.*, and their efforts should therefore be directed to the raising of another 4,000*l.*

Veterinary Committee.

The Earl of NORTHBROOK (Chairman) said that with reference to the reply of the Board of Agriculture to the deputation from the Society on December 6, 1905, a letter had been received from Sir Thomas Elliott, dated December 15, 1905, intimating that the Treasury had decided to make a grant of 800*l.* to the Royal Veterinary College for the year 1906-7. At the request of the Committee, Sir John McFadyean had explained that this Treasury grant of 800*l.* had been made to the Royal Veterinary College in order that it might be placed in the position of a recognised school of the University of London, and that the grant was conditional upon the requirements of the University of London being met by the College. These requirements involved an increase of staff and an increase in the building accommodation; so that no portion of the grant would be available for the provision of the veterinary privileges hitherto accorded to the Members of the Royal Agricultural Society in return for the Society's annual grant. The Committee had arrived at the conclusion that it was essential that the veterinary privileges hitherto accorded to Members should be continued; and they resolved to recommend to the Council that a grant of 200*l.* be made to the Royal Veterinary College for the year 1906, upon the understanding that the College would afford the same privileges to the Governors and Members of the Royal Agricultural Society as heretofore.

Lord NORTHBROOK, in presenting this report, said that it made absolutely clear the position of the Society with regard to the grant given by the Treasury to the Royal Veterinary College. That grant was given for special higher Veterinary Education, and was ear-marked for that purpose. Not one penny of that sum of money could go to the relief of work done by the Royal Veterinary College for this Society. The Committee had had, therefore, to consider the question as if that grant had never been made. They had come to the conclusion that it would be very unfortunate if they had to discontinue the work done through the Royal Veterinary College. That work had been of great benefit to the Members of this Society, and to farmers, stock owners and breeders throughout the whole country. The Society's grant was the only money that was available for this purpose, and if it was discontinued the work would have to cease, and the veterinary privileges of their Governors and Members would have to come to an end. He hoped, therefore, that the Council would continue the grant, and he begged to move the adoption of the report, and also a formal resolution that a grant of 200*l.* be given to the Royal Veterinary College for the present year on the same conditions as before.

Mr. REYNARD seconded, and the motion was formally adopted, Mr. ADEANE explaining, in reply to a question by Sir CHARLES KNIGHTLEY, that the grant involved no increase on last year's expenditure.

WEDNESDAY, FEBRUARY 7, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

The late King Christian of Denmark.

The PRESIDENT said that since the last meeting of the Council they had all read with great sorrow the news of the bereavement that had befallen the Royal Family by the death of His Majesty the King of Denmark. Their deepest sympathies had gone out to

Her Majesty Queen Alexandra, to His Majesty King Edward, and the rest of the Royal Family. He desired, therefore, to propose from the Chair the following resolution, which he was sure would meet with unanimous acceptance:—

> That this Council desire to place on record their deep sense of sorrow for the death of His Majesty King Christian IX. of Denmark, and to convey their respectful sympathy to His Majesty the King and Her Majesty Queen Alexandra in the great loss which they have sustained.

H.R.H. PRINCE CHRISTIAN seconded the resolution, saying they all felt the deepest sympathy with their Majesties the King and Queen under these melancholy circumstances, which were the more sad owing to the sudden and unexpected character of the event. The resolution was adopted unanimously, all the Members standing.

Death of Mr. J. P. Cross.

The PRESIDENT said he regretted to have to report officially the death, on the 4th inst., of their colleague, Mr. J. P. Cross, who was elected last year as an ordinary Member of Council, representing the division of Leicestershire. Mr. Cross was well known as a breeder of Shire horses, and as an exhibitor at their Shows, and the Council would regret very much that his services should have been so soon lost to the Society.

Finance Committee.

Mr. ADEANE (Chairman) reported that the Committee had considered the draft balance-sheet and statement of receipts and expenditure for the year 1905, which they recommended should be approved by the Council, and ordered to be submitted to the auditors for final examination (see Vol. 66, 1905, pp. xvi-xix).

The Committee also presented the following estimate of ordinary receipts and expenditure (other than the Show) for the year 1906, which they had prepared on the basis of the recommendations of the Special Committee in their report of September 21, 1905 :—

RECEIPTS.	£
Subscriptions for 1906 of Governors and Members	6,850
Sales of publications, &c. (exclusive of Journal, deducted from cost of production)	150
Total receipts	£7,000

EXPENDITURE.	£
One quarter's salary to March, 1906, of old Officials of the Society	499
Salary of new Secretary for 1906	600
Salaries of other new Officials (three-quarters of £900)	675
Pensions	190
*Rent, lighting, cleaning, wages, &c. (say).	1,900
Printing and stationery	400
Postage, telegrams, carriage, &c.	150
Miscellaneous	100
Journal	600
Chemical Department	600
Botanical and Zoological Department	460
Veterinary Department	200
Examinations for National Diplomas in Agriculture and Dairying	200
Contributions from Governors' and Members' subscriptions to the expenses of the Annual Show	2,000
*Park Royal (say six months' interest, rates, taxes, &c.)	1,000
Total estimated expenditure	£9,574

* Extraordinary expenditure—arrangements for the sale or sub-letting of Harewood House and for the sale of Park Royal not having been completed.

Mr. ADEANE, in moving the adoption of this report, explained in detail the items of the balance-sheet and of the statement of ordinary receipts and expenditure for the year 1905. He said that the total receipts for the year amounted to 6,337*l.* 6*s.* 2*d.*, and the expenditure to 7,821*l.* 8*s.* 7*d.*, leaving a deficit to be carried to the balance-sheet of 1,484*l.* 2*s.* 5*d.* He pointed out that the sheet did not represent a cash statement of receipts and expenditure. On the side of expenditure there would be found actual payments, and also estimates of payments. He illustrated this point by reference to the Journal, the net cost of which was put down at 600*l.*; whereas only a little over 100*l.* of that amount had been actually paid. The item represented, however, expenditure incurred during the year 1905. As long as they kept in mind the difference between the word "expenditure" and the word "payment" the matter would be clear. Whilst the receipts represented actual cash payments, the expenditure included not only cash payments, but all liabilities incurred in connection with the year's transactions.

Having also explained in detail the figures of the balance-sheet,

Mr. Adeane stated that if the Society's assets were correctly valued and the property were liquidated, the Society would appear to be worth 2,627*l.* 16*s.* (as shown under the heading of "Available capital") in addition to the Society's interest in Harewood House and the Park Royal estate.

With regard to the estimate of receipts and expenditure for the year 1906, the income was estimated at 7,000*l.*, made up of 6,850*l.* subscriptions, and 150*l.* from the sale of publications other than the Journal. The former figure was based on the promises of subscriptions to the present date, and showed (although they were only in the second month of the year) an increase over last year of 500*l.* The latter figure was based on the average amount received annually under this heading.

The expenditure would be in some respects abnormal. With regard to the item, "One quarter's salary of old Officials of the Society, 499*l.*," it would be remembered that under the recommendation of the Special Committee the whole cost of administration was not to be more than 1,500*l.* Of this sum, 600*l.* was absorbed by the Secretary's salary, leaving 900*l.* for other officials. It would be found, however, that there was, in fact, an excess of 274*l.* over the allowance of 1,500*l.* That was owing to the salaries due to old Officials for the first quarter of the year.

With regard to the item for "Rent, &c., 1,900*l.*," he thought the Council would agree that that was too large a sum to pay for rent, and the Committee hoped that before the end of the year some arrangement would have been made to reduce that figure to a reasonable amount, which, in his opinion, should certainly not be more than 1,000*l.* There was, therefore, an excess of 900*l.* under this heading.

As to the items for Park Royal, making 1,000*l.*, that, of course, was abnormal; but there would be certain expenses to be met in the course of liquidation. Therefore, to sum up, he should say that the excess of expenditure over the normal was: (1) Official salaries, 274*l.*; (2) Rent, &c., 900*l.*; (3) Park Royal, 1,000*l.*; making a total extraordinary expenditure of 2,174*l.* He thought they might hope that the ordinary expenditure of the Society would in future years be kept within the figure of 7,400*l.* The estimate he presented did not include losses on Shows, but it did include a "Contribution to the Show expenses" of 2,000*l.*, and in this there was a difference from the practice of former years. He believed that something like 1,400*l.* was charged to the Show account last year for official administration, but for 1906 they were not only not asking the Show account to bear any share of the administrative expenses at the head office, but the ordinary account was contributing to the Show funds the sum of 2,000*l.*

Looking to the future, he thought they must expect from time to time losses on the Shows. Fortunately, this year, through the generosity of a friend of the Society, they were guaranteed against any loss, but if they were going impartially to visit the different parts of England they must be prepared to incur occasional losses on Shows. Therefore, he thought it most desirable—and he hoped the Council would agree with him—that they should at once set to work to form a Reserve Fund, and that such Fund should consist of donations, life compositions, any Show profits, and other moneys that might accrue. He hoped, moreover, that in future years they would have a balance of income over expenditure which could be put to the Reserve Fund also.

WEDNESDAY, MARCH 7, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

The late King Christian of Denmark.

A letter was received from the Secretary of State for the Home Department, stating that the message of condolence of the Council, on the occasion of the death of His Majesty King Christian of Denmark, had been laid before their Majesties, and had been very graciously received.

Finance Committee.

Mr. ADEANE (Chairman) reported the Committee's recommendation that a new account be opened with the Society's Bankers, to be called the "Reserve Fund," and that the proceeds of the timber sales, and all donations and life compositions of Governors and Members, as from January 1, 1906, be paid into such account.

Veterinary Committee.

Sir NIGEL KINGSCOTE reported that a letter had been received from the Central Chamber of Agriculture, inviting the Society to join in a Deputation to the President of the Board of Agriculture to urge upon him the necessity of keeping the present restrictions in force with regard to the importation of live cattle from abroad. As the Deputation had been fixed to take place on the afternoon of March 6, it had not been possible for the Committee to bring the matter before the Council; but in view of the urgent importance of the question, and the action previously taken by the Society in the same direction, the Committee were unanimously of opinion that the Society should be represented at the Deputation. They therefore requested the following Members of Council to attend the Deputation as the official representatives of the Society:—The President, the Right Hon. Victor Cavendish, M.P., Mr. J. Bowen-Jones, Lt.-Col. J. F. Curtis-Hayward, Mr. F. Reynard, Mr. E. W. Stanyforth, and Mr. C. W. Wilson, with Mr. Ernest H. Godfrey, of the Society's office (see below).

Shows of 1907, 1908, and 1909.

The PRESIDENT reported that the the Committee, appointed to consider a scheme of rotation for the holding of the Society's future Annual Shows, were unable to submit an entirely new scheme of rotation, but they recommended that for the Shows of the next three years—1907, 1908, and 1909—endeavours should be made to obtain offers of sites from the following districts:—Eastern District, 1907; Western District, 1908; Northern District, 1909.

In answer to questions raised by Mr. ADEANE and the Earl of FEVERSHAM, Mr. CRUTCHLEY explained that the Committee were of opinion that in defining the districts it was not necessary for a strict line to be drawn between them.

Deputation to the Board of Agriculture.

TUESDAY, MARCH 6, 1906.

Earl CARRINGTON, G.C.M.G. (President of the Board of Agriculture), received, on Tuesday, March 6, 1906, a Deputation organised by the Central and Associated Chambers of Agriculture, and consisting of representatives of agricultural societies throughout the United Kingdom, who waited upon him for the purpose of urging the necessity of keeping the present restrictions in force with regard to the importation of live cattle from abroad. The Deputation was received in the Westminster Hall Grand Committee Room, which was crowded with the large number of representatives who attended.

With the President of the Board of Agriculture were Sir Edward Strachey, Bart., M.P., Sir T. H. Elliott, K.C.B. (Permanent Secretary), Mr. A. W. Anstruther (Assistant Secretary), and Mr. F. L. C. Floud (Private Secretary).

The Royal Agricultural Society of England was represented by the following Members of the Council:—Mr. F. S. W. Cornwallis (President), the Right Hon. Victor Cavendish, M.P., Mr. J. Bowen-Jones, Lt.-Col. J. F. Curtis-Hayward, Mr. F. Reynard, Mr. E. W. Stanyforth, and Mr. C. W. Wilson, with Mr. Ernest H. Godfrey, of the Society's office.

Mr. T. COURTENAY WARNER, M.P. (Chairman of the Central Chamber of Agriculture), having introduced the Deputation, Mr. B. St. JOHN ACKERS (Chairman of the Cattle Diseases Committee of the Central Chamber) explained the object of the Deputation,

and presented arguments and statistics in favour of the maintenance of the existing law.

Mr. F. S. W. CORNWALLIS said he had the honour as President this year of the Royal Agricultural Society of England to attend with his colleagues on behalf of the Society in support of the important object of the Deputation. They were unanimously requested to attend by the Society's Veterinary Committee, who had for many years past taken an active part in the efforts to eradicate the contagious diseases of animals in this country.

The Royal Agricultural Society, as his Lordship was aware, was keenly interested in the valuable pedigree herds and flocks of the stock owners of this country ; and the freedom of these herds and flocks, as well as all descriptions of farm live stock, from contagious diseases was a matter of the most vital national concern. (Cheers.) The Act of 1896, by which for the first time foreign animals were definitely excluded from landing in this country, except for slaughter at the port of debarkation, was the final outcome of many years of strenuous agitation on the part of agriculturists and stock owners, dating from the disastrous outbreak of cattle disease in the sixties. As his Lordship knew, the farmers of this country had also suffered incalculable losses from pleuro-pneumonia and foot-and-mouth disease. Both these diseases were imported into this country from abroad, and they were still prevalent in foreign countries.

The Society which he represented, and he thought he might add, the whole of the stock owners of this country, were of one mind that any lessening of the restrictions at present in force against the importation of live cattle would create a widespread feeling of alarm, would affect most prejudicially the country's important export trade in pedigree live stock, and would have ruinous and disastrous effects upon what was at present the most hopeful and remunerative feature of British agricultural industry. (Cheers.) By the operation of the existing law in the past, pleuro-pneumonia and foot-and-mouth disease had been eradicated from this country, and they felt that if they were to maintain their present freedom from these diseases, it was essential that the present law should be maintained in force. They felt also that if through any relaxation of the present law these diseases should be again admitted, the compensation that would have to be paid to stock owners for animals slaughtered would be almost incalculable. It was extremely difficult to place an accurate value upon the pedigree live stock of this country. In fact, the value of this class of stock to owners and to the country generally was practically inestimable.

The late Mr. T. C. Booth stated in evidence before a Parliamentary Committee that the losses in his celebrated Warlaby herd from repeated outbreaks of foot-and-mouth disease alone amounted to no less than 30,000*l*. In 1888, the Departmental Committee on Pleuro-pneumonia reported that pleuro-pneumonia was an imported disease, and was not indigenous to this country ; that it was an incurable disease communicated by contact between living animals only ; and that its treatment should be of a preventive and not of a curative nature. He would therefore point out that if the present law was repealed a great feeling of insecurity would be created in the minds of the breeders of live stock throughout the country. (Hear hear.) They had to look also not only at the position at home, but to the effect which any such action would be likely to have in other countries, and especially to the regulations which foreign countries might impose for the admission of live stock exported from this country. (Cheers.)

Other speeches in support of the object of the deputation were made by Lord NORTHBOURNE (British Dairy Farmers' and Southdown Sheep Breeders' Associations), Mr. JOHN TREADWELL (Bucks. Chamber of Agriculture), Sir OSWALD MOSLEY (Shorthorn Society and National Cattle Breeders' Association), Mr. F. A. CHANNING, M.P. (Central Chamber of Agriculture), Sir JOHN COTTRELL

(Bath and West of England Society and the Hereford Cattle Herd Book Society), Mr. E. W. STANYFORTH (Royal Agricultural Society of England and the Shorthorn Society), Capt. J. CRAIG, M.P. (Ulster Agricultural Society), and Mr. R. G. CARDEN (Royal Dublin Society).

Lord CARRINGTON, in the course of his reply, said that his colleagues desired him to state that they were not in any way blind to the existence of a very strong feeling of apprehension in the minds of a very large portion of the agricultural population that a change in the law would be a serious danger to the community at large. He was not able to give any distinct announcement as to what the final decision of the Government might be. The Government was happily in possession of veterinary advice of the very highest class, and now the matter must go before the Cabinet for its final decision. He would take care that the views and arguments of the Deputation should be laid before his colleagues. The question would be decided on its merits as affecting the health and the well-being of their live stock industry, the magnitude and importance of which the Government most fully realised. (Cheers.) They could not hope to please both sides, but they would do their duty without partiality, favour, and affection.

Mr. COURTENAY WARNER thanked the President for his reception of the Deputation, and the members of it then withdrew.

Abstracts from the Proceedings of the Council.

WEDNESDAY, APRIL 4, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Sale of Park Royal.

Mr. ADEANE, in moving the adoption of the report of the Finance Committee, said that, in accordance with a resolution come to by that Council in November last, the Directors of Park Royal had arranged that that estate should be put up for auction on May 22. Of course, as that time approached, they would have to think about what amount they should fix as the reserve price, and the Directors did not feel that they would be justified in taking that important step without first consulting the Council, because all the shares in that Company were held by the Royal Agricultural Society.

The Council would probably agree that it was undesirable that the reserve price should in any way be published before the sale, and doubtless they would think it advisable that the subject should not be debated in the Council. He suggested, as Chairman of the Directors of Park Royal, Limited, that the Council should instruct their Finance Committee to fix the price, in conjunction with the Directors of the Company; and if that was the wish of the Council, probably some one who was neither a member of the Finance Committee nor a Director of Park Royal would propose a resolution to that effect.

Mr. C. W. WILSON thereupon moved: "That it be an instruction to the Finance Committee, acting in conjunction with the Directors of Park Royal, Limited, to fix the reserve price to be placed on the property in the forthcoming sale of the Park Royal estate."

Mr. ERNEST MATHEWS having seconded the motion, it was put from the Chair, and carried unanimously.

WEDNESDAY, MAY 2, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

House.

On the motion of the PRESIDENT, the Council resolved themselves into Committee to consider the recommendation of the House Committee that the offer they had received for Harewood House be accepted by the Council.

A lengthy discussion followed, in which several of the Members present took part, and eventually the report, with the omission of the reference to the offer for the House, was received and adopted.

Chemical and Woburn Committee.

Mr. BOWEN-JONES (Chairman) reported that the Committee had considered the Fertilisers and Feeding Stuffs Bill of the Government, together with a memorandum thereon prepared by the Society's Consulting Chemist. Since the issue of this memorandum certain amendments had been made in the Government Bill; and after full discussion the Committee had resolved that a letter in the following terms should be addressed to Sir Thomas Elliott, the Secretary of the Board of Agriculture and Fisheries:—

> The Council of the Royal Agricultural Society of England having taken into consideration the Fertilisers and Feeding Stuffs Bill as put forward by Sir E. Strachey and the Solicitor-General, and as subsequently proposed to be amended by Sir E. Strachey, desire to make representations on the following points:—
>
> 1. Section 3, sub-section 2, line 11.—The insertion of the words "by the agricultural analyst," after the words "samples for analysis," would make it clear that the work was to be done by the person holding the official appointment under the Act, and not by some one else.
> 2. Section 4, line 14.—Similarly it would be well here to insert after "to have analysed," the words "by the agricultural analyst."
> 3. Section 3, sub-section 3.—In this sub-section there is no provision for the forwarding of the invoice, or a copy of it, to the agricultural analyst, when the sample is submitted for analysis, but only in the case of a sample being submitted to the chief analyst. The Council think it only right that the analyst should be informed of the description under which the goods were sold and the guarantees under which they were sold, so that he may be able to know what he is required to determine, and how to report as to whether the purchaser has been prejudiced or not. Such information as this ought to be supplied to the analyst when the sample is sent.
> 4. Section 5, sub-section 2.—The Council think it very desirable that the expression "agricultural body or association" should be more clearly defined, and they would be glad to have an assurance from the Board of Agriculture that this clause is not intended to apply to bodies aided by payments from the rates, and with which the Royal Agricultural Society and other similar associations carrying out analytical work could not compete on fair grounds.
> 5. Section 6, line 20.—It appears to the Council desirable that provision be made for the tracing back of the offence to the original offender.

The Committee had further recommended that the views of the Council, as expressed in the letter, should be represented to individual Members of the Standing Committee on Law.

WEDNESDAY, MAY 30, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Death of Mr. A. C. Cope.

The PRESIDENT announced that he had just heard of the death of Mr. A. C. Cope, and made a sympathetic reference to his services to the Society as a professional member of the Veterinary Committee. Mr. Cope had been an Honorary Member of the Society since 1901.

The Society's House.

Sir NIGEL KINGSCOTE moved, Mr. CARR seconded, and it was resolved, that the Finance and House Committees jointly take the necessary steps for securing new premises for the housing of the Society when the negotiations for the disposal of Harewood House had been completed.

Journal Committee.

Sir JOHN THOROLD (Chairman) reported that the suggestion made by Mr. J. W. Glover at the last meeting of the Council that Farm Prize Competitions should again be undertaken by the Soeiety had beeu eonsidered by the Committee, but they regretted that they were unable to recommend its adoption.

Sir JOHN THOROLD added that the Committee had carefully eonsidered the reeommendation of Mr. Glover, and on reference to old volumes of the Journal he found that in some cases the expenses connected with these eompetitions amounted to over 1,000*l.* a year. It was therefore impossible for them to recommend the Committee again to embark on a scheme for giving prizes for farms.

Mr. GLOVER said he was very mueh obliged to the Committee for considering this matter, and hoped that at some future time the Counеil might see their way to take the matter up again. In his opinion the eompetitions had done good in the past.

Show of 1907.

Sir JOHN THOROLD (Chairman) reported that a letter dated May 28, 1906, had been received from the Mayor of Ipswich inviting the Soeiety to hold its Show of 1907 at Ipswich.

The Committee reeommended the appointment of a Committee of Inspection, eonsisting of the President (Mr. Cornwallis), the Honorary Direetor (Sir Gilbert Greenall), the Chairman of the Finanee Committee (Mr. Adeane), the Chairman of the Stock Prizes Committee (Mr. Reynard), the Chairman of the Implement Committee (Mr. Greaves), to visit Ipswich and any other sites which might be offered before the next meeting of the Council.

The PRESIDENT announced that a resolution passed by the Essex Agricultural Society had been handed in by Mr. John Barker, the Member of Council for Essex, asking whether the Royal Agricultural Soeiety would consider an invitation to hold the Show of 1907 in the county of Essex. Mr. Barker explained that next year the Essex Society would celebrate its fiftieth anniversary, and were desirous that the Royal Agricultural Society's Show for 1907 might be held in their county, when they would do all in their powcr to make the Show a great success. It was an interesting fact that the Essex Show was instituted fifty years ago on the occasion of the Soeiety's visit to Chelmsford in 1856.

Proceedings at General Meeting of Governors and Members,

HELD IN THE LARGE TENT IN THE SHOWYARD AT

DERBY,

THURSDAY, JUNE 28, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Present on the Platform.

Trustees.—The Earl of Coventry, Col. Sir Nigel Kingscote, G.C.V.O., K.C.B., Lord Middleton, Lord Moreton.

Vice-Presidents. — Mr. J. Bowen-Jones, the Right Hon. Victor C. W. Cavendish, M.P., Mr. Percy Crutchley, Mr. J. Marshall Dugdale, the Right Hon. Ailwyn E. Fellowes, the Earl of Northbrook.

Other Members of Council. — Mr. George Adams, Mr. C. R. W. Adeane, Mr. T. L. Aveling, Mr. John Barker, M.P., Mr. R. G. Carden, Sir Riehard P. Cooper, Bart., Lt.-Col. J. F. Curtis-Hayward, Mr. John T. C. Eadie, Mr. J. W. Glover, Mr. William Harrison, Mr. Arthur Hiscock, jun., Mr. R. W. Hobbs, Mr. J. Howard Howard, Mr. Ernest Mathews, Mr. W. A. May, Mr. T. H. Miller, Mr. Ralph Palmer, Mr. Claude M. S. Pilkington, Mr. G. G. Rea, Mr. William Scoby, Mr. E. W. Stanyforth, Mr. Riehard Stratton,

Mr. Herbert Tallent, Mr. John Thornton, and Mr. Christopher W. Wilson.

There was also in the tent a large gathering of the general body of Members.

The PRESIDENT, in opening the proceedings, said that their first thought would be that, with the exception of what they hoped was only a temporary shower of rain, they met in the Show-yard under very pleasant and encouraging circumstances. (Hear, hear.) Within a very short time the Show would be honoured by a visit from His Most Gracious Majesty the King, and no one needed to be reminded of what inestimable value His Majesty's support had been to the Society, not only that day, but in past times. That he should graciously come to visit them at so great a distance from London was another proof of His Majesty's interest in their Society, for which they were respectfully and sincerely grateful. (Hear, hear.) The Society must acknowledge with great gratitude the efforts of the Mayor and citizens of Derby to give them a handsome reception. (Applause.) Their welcome had been given whole-heartedly and in no stinted manner, and whilst the time at the Society's disposal when they accepted the invitation to visit the town was not too long, yet the vast energy displayed on the one hand by the Local Committee and on the other hand by Sir Gilbert Greenall and the Staff of the Society would allow them to say they had on the show-ground a collection of exhibits worthy of the Society, and a Show very well staged indeed. (Hear, hear.) The Council's only hope was that in its final result the Show might be satisfactory to the Society and a gratification to the people of Derby. (Applause.)

Thanks to Mayor and Corporation.

Lord COVENTRY said he had the honour to move: "That the best thanks of the Society are due and are hereby tendered to the Mayor and Corporation of Derby for their cordial reception of the Society." He was sure every Member of that great Society would participate in the vote. They had never been more hospitably received in any other part of the country than in that ancient borough. (Hear, hear.) Those who had driven through the streets must have been gratified by the beauty of the decorations, and the same generous hospitality had been evinced in many other directions. He was sure the meeting would join in giving Derby hearty thanks for the welcome. (Applause.)

The Right Hon. AILWYN FELLOWES, in seconding this resolution, thought he could not do better than re-echo the words which had fallen from the President and Lord Coventry. He thought it was a happy omen that in the new departure the Society had been received with such pleasant feelings by the Mayor and Corporation. (Hear, hear.) The resolution was then put to the meeting and carried by acclamation.

Thanks to Local Committee.

Lord MIDDLETON said he had to move: "That the best thanks of the Society are due, and are hereby tendered, to the Local Committee for their efforts to promote the success of the Show." He was sorry that the Mayor was unable to be present, being engaged elsewhere, but he was ably represented by Mr. Pakeman, who, as Chairman of the Local Committee, had regularly attended the meetings, no doubt at great inconvenience and considerable trouble. As soon as it was known that the Show was to be held in Derby the Mayor and the Corporation at once took up the work, and put forth all the energy and zeal possible with a view to assisting the Council to make the Show a success.

Mr. ALFRED ASHWORTH seconded the motion, and complimented the Local Committee on the admirable manner in which they had done their work. He had attended the Shows of the Society for forty years, and he never remembered an occasion where the Society had received a warmer welcome than that which had been given them by the ancient town of Derby on the occasion of what he might term a return to their travelling system. He looked upon it as a good augury for the future success of the Society, and hoped the example would be copied by other counties.

The resolution having been carried,

Mr. JOHN PAKEMAN, on behalf of the Mayor and Corporation and the Local Committee, returned thanks

for the vote. He was sure that one and all would feel gratified at the kindly way in which their services had been noted. When it was known that the Society desired to come to Derby, from the very first it was the feeling of the people of Derbyshire that they should do their very utmost to make the Royal Show a great success—(hear, hear)—and within a few hours of the information being received—for which they were indebted to their good friend, Mr. Eadie, a Member of the Council—the Derbyshire Society had a meeting, and unanimously and enthusiastically decided to give up their own Meeting for this year and throw themselves into the fray to make the Royal Show a great success. From that day not a single Member of the Committee had been slack, but every one of them had done their level best. While they appreciated their thanks, they would also bear testimony to the great consideration and the very charming manner in which they had been received by the Council of the Society, from whom they had rceeived the greatest assistance, from the President downwards. He could only add that if ever at any future time they decided to bring the Royal Show to Derby, they would be sure of a hearty welcome and of everything being done to make the Show a success.

Thanks to Railway Companies.

Mr. R. MILLINGTON KNOWLES said he had been asked to move: "That the best thanks of the Society are due, and are hereby tendered, to the various railway companies for the facilities afforded by them in connection with the Show." It was quite unnecessary for him to point out the great facilities the railway companies had given not only to exhibitors sending stock, but also to passengers coming to the Show. It was, of course, in their interest to do so, but it was also a great benefit to the Society.

Mr. AVELING thoroughly endorsed what had been said by the proposer of this resolution. If it were not for the railway companies they would not then have been at Derby. At the same time the railways took money out of their pockets, and it was only right that they should give facilities in return. He had much pleasure in seconding the motion. The resolution was then put, and was carried unanimously.

Suggestions of Members.

In response to the usual inquiry from the Chair as to whether any Governor or Member of the Society had any remark to make or suggestion to offer that might be referred to the Council for consideration,

Mr. JAMES WATT said he had been asked on behalf of a good many exhibitors of all classes to impress upon the Council the desirableness of the railway companies giving the general public the facilities of travelling to the Show at reduced fares, a privilege which was accorded by the Scottish railways to their fellow-countrymen across the Border. (Hear, hear.)

Mr. W. P. J. ALLSEBROOK said that on the last occasion when the Society visited Derby, in the year 1881, prizes for farms were offered by the Society. It was said by many that there was no class that helped agriculture more than such competitions, and he suggested on behalf of many of their friends, both Members and other farmers, that the farm prize competitions should be revived.

Mr. ROBERT TINNISWOOD supported the suggestion, saying that those who cultivated their farms well made agriculture profitable for the landlords and themselves, and he was sure the Society would get local sympathy and support if this suggestion were adopted.

Mr. ELDRED G. F. WALKER said he had been asked by a number of cider makers whether the Council could not possibly see fit to appoint a second Judge. Cider was one of the most delicate things for a man's palate, and though they could not have a better Judge than Mr. Ettle, yet it was important for him to have an assistant, as some of the samples were flavoured, and spoilt the palate for other samples. He also drew attention to the arrangement made for showing butter, which, in his opinion, was very antiquated. It was not educational, and it wasted tons of ice. If some refrigerating arrangement could be adopted, the butter would not be in the state it then was.

The PRESIDENT said that a note had been taken by the Secretary of the various points raised, which would be considered by the Council. Some of them had received consideration, but would be again brought under notice.

Thanks to Chairman.

Mr. JOSEPH MARTIN, in moving a vote of thanks to the Chairman, said that as an old Member of Council he had had the pleasure of acting with the President. Mr. Cornwallis had always been willing to exert his influence on behalf of anything for the benefit of agriculture. He had taken office under unfavourable circumstances, but he was the right man in the right place. The result of their present Show proved that he had done his duty not only to the satisfaction of the Royal Agricultural Society, but with great credit to himself. He had much pleasure in proposing a vote of thanks to Mr. Cornwallis for his services in the Chair.

Mr. RICHARD STRATTON seconded this resolution. As one of the oldest of the present Members of the Council he had known very many predecessors in the office held by Mr. Cornwallis who were most excellent men of business, but no President had had a more arduous time or had done his duty better than Mr. Cornwallis. He could assure them that the amount of work and anxiety that had devolved upon the President was more than many of them could realise. He had had to employ practically the whole of his time and thoughts in the interests of the Society. They had had to go through a very important stage, and he hoped he might say that great reforms had been effected. In future they would look back upon Mr. Cornwallis's year as being the turning point in the Society's career of prosperity.

The SECRETARY then put the resolution, and it was carried by acclamation.

The PRESIDENT, in reply, thanked the meeting most sincerely for the vote which had been passed. This vote of thanks on previous occasions had generally contained a valedictory note, but under the new bye-laws he had another five months to hold office as President of the Society. He hoped that the rest of his term of office might be free from a great deal of the anxiety that had undoubtedly hung over the earlier part of it. No one could have received greater indulgence or more loyal support from his colleagues. As the previous speaker had said, changes of considerable importance had been effected. Those changes had necessarily entailed a large amount of work upon all connected with the Society, especially upon the staff, and that staff a reduced one, for the state of their finances had compelled them, to their great regret, to part with many who had worked most loyally and well for the Society, and who had been bound to it by the closest ties. He would not be doing justice to them if he did not acknowledge the great help that they had given to the new Secretary when he was taking over his duties. He was perfectly certain that the Secretary would desire to acknowledge that assistance as sincerely as he did.

He had also to acknowledge the help that Mr. McRow had given him on all occasions. That he had come to them as no recruit in the Society's service was proved by the way he got into his saddle almost directly, and he had worked hard ever since. Other changes of great importance had had to be carried through. These were matters of common knowledge, and were absolutely necessary in the state of the Society's finances at the time. Might he say, in conclusion, that whatever economies were practised, whatever energies were thrown into the various spheres of the Society's work, none of them considered that the Society could be firmly established until they reached a considerably larger membership? He appealed to every Member to help them in this respect. With their help he was sure that the Society would get the support which they and he believed it so richly deserved. He thanked them very heartily for their vote of thanks, and assured them that there was no honour which he appreciated more than that of being President of their great National Agricultural Society.

The proceedings then terminated.

Abstracts from the Proceedings of the Council.

FRIDAY, JUNE 29, 1906.

MEETING HELD IN THE SHOWYARD AT DERBY.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Disposal of Harewood House.

Mr. ADEANE presented a detailed report from the Finance and House Committees on the progress of the arrangements for the disposal of Harewood House. The report recommended certain modifications in the provisions of the original Trust Deed made between the Society and the Trustees of Harewood House Debenture Stock on August 2, 1893. The present Trustees had agreed to these modifications on condition that any surplus revenue which might arise after payment of the debenture stock interest at the end of each year should be handed over to the Trustees as a further fund for the repayment of the stock. The Finance and House Committees were of the opinion that this condition was a reasonable one in the interests of the stockholders, and they recommended the Council to assent to it. They also submitted for the approval of the Council, a draft Supplemental Trust Deed embodying the modifications agreed upon.

On the motion of Mr. ADEANE, seconded by Mr. CARR, the Report of the Finance and House Committees was adopted, and the Supplemental Trust Deed was formally approved.

WEDNESDAY, AUGUST 1, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Finance.

Mr ADEANE (Chairman) reported the Committee's recommendation that the Directors of Park Royal, Limited, be requested to take the necessary steps to wind up the Company as soon as practicable after the completion of the sale of the estate.

Mr. ADEANE, in presenting the report, announced that a statement of accounts connected with the Derby Show had been prepared, from which it appeared that the result would be a financial success. Approximately the profit would be 2,000*l*., in addition to the Society's contribution of 2,000*l*. from Members' subscriptions.

Show of 1907.

Deputations attended in support of the resolutions received from Ipswich and Lincoln inviting the Society to hold its Show of 1907 in their respective cities. The deputation from Ipswich was introduced by Mr. ALFRED J. SMITH (the Member of Council for the Division of Suffolk) and consisted of the Mayor (Mr. B. H. Burton), the Earl of Stradbroke, Mr. Ernest G. Pretyman, Mr. Herman Biddell, Mr. William F. Paul, Mr. J. F. S. Gooday (General Manager of the Great Eastern Railway), and Mr. W. Bantoft (Town Clerk). Speeches were made by the MAYOR OF IPSWICH, Mr. ERNEST PRETYMAN, Mr. J. F. S. GOODAY, and Mr. HERMAN BIDDELL. Various questions having been answered by the deputation, the PRESIDENT thanked the Mayor of Ipswich for the invitation, and said that it would receive the careful consideration of the Council.

The deputation from Lincoln was introduced by the Earl of YARBOROUGH, and consisted of the Mayor of Lincoln (Mr. C. A. Newsom), Mr. C. W. Pennell, Mr. W. T. Page, jun. (Deputy Town Clerk), and Mr. W. Frankish (Secretary of the Lincolnshire Agricultural Society). Speeches were made by the Earl of YARBOROUGH and the MAYOR OF LINCOLN.

The Earl of ONSLOW said he understood that there would probably be no

difficulty in guaranteeing the Society against any loss, but he did not understand that that amounted to a definite proposal on the part of Lincoln or Lincolnshire.

The MAYOR OF LINCOLN, in reply, said he did not know that they could go so far as to give an absolute guarantee, but he thought that his friends would bear him out in saying that any loss would be borne by the city and county.

The PRESIDENT thanked the deputation for attending the meeting, and congratulated the Mayor of Lincoln on the fact that the city was now in a position to offer the Society an invitation. He had reason to know what a visitation it was for a town to have such an epidemic as was experienced by Lincoln.

The deputation then withdrew.

Mr. ADEANE moved, and Mr. RICHARDSON CARR seconded, a resolution to the effect that the Society should hold its Show of 1907 at Ipswich.

Mr. HARRISON moved, and Sir GILBERT GREENALL seconded, an amendment to the effect that the Society should hold its Show of 1907 at Lincoln.

After discussion, the PRESIDENT put the question, when, on a show of hands, the amendment in favour of Lincoln was carried by twenty-seven votes to eleven. It was then formally decided to hold the Show of 1907 at Lincoln from June 25-29.

Disposal of Harewood House.

Sir NIGEL KINGSCOTE (Chairman of the House Committee) reported that a meeting of the holders of Harewood House debenture stock had been held on Friday, July 20 last, when the following resolutions were passed, in each case *nem. con.* :—

I. That this meeting of holders of debenture stock of the Royal Agricultural Society of England, constituted by trust deed dated the 2nd day of August, 1893, and made between the said Society of the one part and Hugh Lupus Duke of Westminster, Sir Walter Gilbey, Baronet, and Sir Robert Nigel Fitzhardinge Kingscote, as trustees of the other part (which meeting has been duly convened pursuant to the provisions contained in the third schedule to the said trust deed), hereby assents to certain proposed modifications of the rights of the said holders against the Society and its property and certain modifications of the trust deed which have been proposed by the Society and are recommended by the present trustees of the said trust deed, and doth hereby authorise such trustees, with a view to effectuating such modifications, to concur with the Society in executing a supplemental trust deed in the terms of the draft which has been submitted to this meeting, and has for the purpose of identification been subscribed by the Chairman thereof.

II. That this meeting expresses its opinion that until the repayment of the stock, interest should be paid thereon as from the 1st August next at the rate of 4 per cent. per annum instead of 2½ per cent. as at present, and that the debenture holders should be paid off as soon as practicable, either by sale or mortgages of the ground rent.

III. That this meeting of holders of debenture stock of the Royal Agricultural Society of England, having heard the proposal to let the site of Harewood House, No. 13 Hanover Square, on building lease, with an option to the lessees to acquire the freehold within a limited period, hereby approves of such proposal, and requests the trustees of the trust deed to concur in the letting with or without such modifications as the Society may propose and the trustees may approve.

The arrangements for carrying out the transactions connected with the disposal of Harewood House, as approved by the Council, could now be proceeded with. With regard to Resolution II. the Committee regretted that they could not recommend the Council to adopt the suggestion to alter the interest payable to the debenture stockholders from 2½ per cent. to 4 per cent. The Joint Committee had recommended that the Finance Committee be requested to make the necessary arrangements for defraying the cost of the purchase of the lease of 16 Bedford Square, and the incidental expenses connected with the transference of the offices. They further recommended that the President be authorised to sign on behalf of the Society the agreement for taking the lease of 16 Bedford Square on the terms arranged.

Chemical and Woburn Committee.

Mr. BOWEN-JONES (Chairman) reported that further consideration had been given by the Committee to the scheme for the formation of the proposed Council for Agricultural Research, and the following resolution had been unanimously agreed to :—

The Chemical and Woburn Committee after taking into consideration the scheme submitted to them for the

establishment of a National Council of Agricultural Research, upon which it is proposed that the Society should have two representatives, recommend the Council to give a general approval to the proposed scheme. They recognise the advantages which the formation of such an association would possess as helping to consolidate experimental research throughout the country, and as preventing unnecessary duplication. They feel, however, that the successful working of the scheme must depend very greatly upon the means available for carrying it on, and also upon the system of control which would be exercised, and on these two points they would wish to have fuller information. In view more particularly of the carrying on of the Woburn experiments, which have hitherto been maintained entirely by the liberality of the Duke of Bedford, the Committee feel themselves bound to ask the Board of Agriculture what assurances of support for the future conduct of the work as now organised would be forthcoming in the event of the Society joining the proposed Association.

The Committee recommended that a reply in the terms of the above resolution be sent to the Board of Agriculture.

Botanical and Zoological Committee.

Mr. WHEELER (Chairman) reported that the Committee had further considered the memorandum from the Board of Agriculture and Fisheries as to the proposed Council of Agricultural Research, and were generally in sympathy with the objects of the proposed Council, but in the absence of information as to the way in which the scheme was to be carried out in detail, they did not deem it desirable to abandon the work at present carried out by the Society's scientific officers.

Committee of Selection.

Sir NIGEL KINGSCOTE reported the Committee's recommendation of the appointment of a Sites Committee, to make the necessary arrangements for holding the Society's Shows for 1908 and 1909, and to consist of the following:—Sir John Thorold, Sir Gilbert Greenall, Sir Richard Cooper, Mr. Adeane, Mr. Greaves, Mr. Reynard, Mr. Harrison, and Mr. Richardson Carr, with power to add to their number.

Disposal of Harewood House.

On the motion of the PRESIDENT, seconded by Mr. CRUTCHLEY, it was resolved that the Society's Seal be affixed to the Supplemental Trust Deed effectuating certain modifications of the rights of the holders of Harewood House debenture stock against the Society and its property, and certain modifications of the Trust Deed, dated August 2, 1893, for securing the said stock, as proposed by the Society, recommended by the present Trustees of the Trust Deed, and assented to by the stockholders at the meeting of stockholders convened by the Society and held on July 20, 1906.

WEDNESDAY, NOVEMBER 7, 1906,

HELD AT THE HOTEL RUSSELL, LONDON, W.C.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Resignation of Sir Nigel Kingscote.

The PRESIDENT said he very deeply regretted to have to inform the Council that a letter had been received from Sir Nigel Kingscote to the effect that, by his doctor's orders, he had been compelled to resign active work on the Council of the Society, and had therefore resigned the Trusteeship which he had held so long. Sir Nigel was elected a Member of the Council so long ago as 1863, and the records bore ample testimony to the devoted services he had rendered their great Society. (Hear, hear.) Those who had had the honour and pleasure of working under and with Sir Nigel knew that the bare records did not tell of a tenth of the work he had always been doing on behalf of the Society. He had filled every office in the Society—Trustee, President, Chairman of the Finance and House Committees, had been a member of many others—and he had been Steward of nearly all the Departments at the Annual Shows—in fact, he was always working for the welfare of the Society.

He (Mr. Cornwallis) was sure that he was expressing the opinion of every Member of the Council when he said that Sir Nigel's genial presence, stately bearing, unfailing courtesy, and wise counsel and advice would be very deeply missed at their meetings. As a Governor of the Society Sir Nigel would still watch their proceedings with great interest, and although he would not be an active participator in the work of the Society, it was to be hoped that they would often see him amongst them. Mr. Cornwallis then moved the following resolution :—

> "The Council desire to record on their minutes the great regret with which they learn that Sir Nigel Kingscote is compelled by ill-health to retire from the deliberations of the Council. Since his election to the Council in 1863, he has served as President of the Society in 1877-1878, as Chairman of the Finance Committee from 1875, and Chairman of the House Committee from the same date. He frequently acted as Steward at the Annual Shows, and has been a Trustee of the Society from 1874. In these and other offices and on all occasions his energy, tact, and earnestness have been of inestimable value to the Society, while his courtesy and kindness have endeared him in a special degree to all his colleagues."

H.R.H. PRINCE CHRISTIAN, in seconding this resolution, said he had nothing to add to what the President had said. He only wished to express personally the very great regret he felt at the cause which obliged Sir Nigel to retire from the Trusteeship. He was sure they were all very sorry for it, and were very grateful for all the work he had done and all the interest he had taken for so many years in the Society. Sir Nigel was a very great personal friend of his, and he had known him for many years. His Royal Highness was very sorry that the state of Sir Nigel's health was such that he could not give his attention and aid to the Society as formerly, but he hoped that Sir Nigel would soon be better, and that he might be spared to them for many years.

The resolution was unanimously adopted by the Council.

Prize Sheet for Show of 1907.

Mr. ADEANE reported that the Finance Committee had considered the question of increasing the amount of prizes to be offered by the Society at Lincoln from 4,000*l*., as at Derby, to 4,600*l*., which increase of 600*l*. had been urged by the Stock Prizes Committee to be necessary, but having in view the state of the Society's finances, they could not undertake to recommend the additional expenditure. At the same time they did not feel justified in refusing the application of the Stock Prizes Committee, and therefore had left it to the Council to decide whether the increase asked for should be granted or not. The Committee thoroughly appreciated the wish of the Stock Prizes Committee to increase the prize fund, and they entirely agreed with the principle. Their only difficulty was to find the money, and they felt that they were not really in a position to recommend it, seeing the position of their finances. They must therefore leave it to the Council to take what risk there might be in granting the additional sum asked for. After all, it was a matter of speculation. It might turn out very well. If the profit on the Lincoln Show was sufficient to cover the amount there would be no call on the funds of the Society, but if, on the other hand, there should be a loss, they would undoubtedly have to provide the money. The Finance Committee could not recommend the increase because they would have a considerable deficit on their ordinary balance-sheet this year, and, looking ahead, he did not think that their income would be more than sufficient to meet their expenditure in 1907. Therefore, taking all these points into consideration, the Committee felt it necessary to put the financial position before the Council. No doubt the question would be debated when the Council heard what the Stock Prizes Committee had to say, and they could then come to a conclusion. If it was absolutely necessary the Finance Committee would do its best to find the money.

Mr. REYNARD presented a report from the Stock Prizes Committee recommending that the sum of 4,600*l*. be placed at their disposal for providing prizes for Live Stock, Poultry, Produce, &c., at the Lincoln Show of 1907. He said that the Council would

notice that this was 600*l.* in excess of what was granted to them last year. The Committee had most carefully gone into the proposal, and considering the very handsome additions from the Lincolnshire Local Committee (900*l.*), the Lincolnshire Agricultural Society (134*l.*), and from the various Breed Societies, they felt bound to endeavour to enlarge their prize list for all classes of stock. He would like to point out that although 4,000*l.* was voted last year for their prize list, they had received 4,120*l.*, so that this addition was the small one of 480*l.* in excess of what had been received last year. He therefore trusted that the Council would vote this amount, as it was hoped that the extra prize money would attract more exhibits and make the Royal prize sheet what it ought to be.

With regard to the reduction of fees for horses, there had been very great complaints of late years that they had been too high. There had been a separate charge for the entry fee and a separate charge for stabling, but now it had been reduced and the entry fee included the charge for stabling.

The Hon. Cecil Parker said that it seemed to him that this was the old battle being started again between the Finance and the Stock Prizes Committees. If they had a Finance Committee, why should they not be guided by them? He was of opinion that they should support the Finance Committee and adhere to what they said.

Mr. Wilson appreciated very much the guarded way in which the Chairman of the Finance Committee had brought forward his report. He thought their object was to make the Show as good as possible, and he believed that the increase would not be money thrown away. He would certainly support the Council in giving the extra money.

Mr. Stratton said he had been unable to attend the Stock Prizes Committee on the previous day, but had he been there he should certainly have opposed the proposition which had been made. Considering the financial position of the Society, the action which had been taken with regard to the Special Committee, and the paramount importance of endeavouring to impress upon everybody the necessity for economy, he did think it was premature to increase the amount of the prizes so soon. Naturally, he would like to see the prizes as high as they could possibly afford, but it was most important that they should, at all events for the present, be economical. One thing had been clearly established, and that was that a first-class show by no means depended upon a large prize sheet. He observed that the proposed increase was mainly to be given to horses, and not only was there to be an increase of prizes. but the entry fees were to be considerably reduced, so that there would be a loss on the entry fees, and all for the particular benefit of one section, or mostly so. He did not think that it would give general satisfaction. They had an excellent Show this year, and he certainly thought it premature to do anything further in the way of prize money. He therefore supported Mr. Parker.

Mr. Rowell remarked that, seeing the very handsome way in which the Breed Societies had met them, and the very careful way in which the Stock Prizes Committee had gone through the prize list, he hoped the increase would be granted. They could not expect these Societies to contribute unless they gave a fair prize list, and he thought the worst step they could take would be to pare down their prize sheet below the amount asked by the Stock Prizes Committee, as they could not again expect to be met so well by the Breed Societies. Last year they had asked for the smallest amount that could be offered, and he thought that in view of the successful Show they had had and the support they received from all the Breed Societies, the additional 300*l.* or 400*l.* they had asked for could well be granted. If it was refused, he thought it would be a backward step.

Mr. Palmer said that the Council must make themselves secure by economy, and heartily supported Mr. Parker.

Sir Gilbert Greenall thought it would be a very false economy indeed

if they were not to give a good prize sheet. All the Breed Societies had met them in the most handsome way, and if they desired to retain the support of those Societies, they must give proper prizes. With regard to entry fees, Mr. Stratton had missed the point. Under the present arrangement, if a man entered one horse he had to pay a sovereign for the entry fee, and, in addition, the charge of 2*l.* for a box, or 1*l.* 10*s.* for a stall; but should the animal be entered in more than one class he only paid the charge for the box or stall once. An exhibitor who entered a small pony in one class only had to pay 2*l.* 10*s.*, and this deterred many owners from entering. Under the new arrangement the inclusive charge of 1*l.* 10*s.* for each entry would be found to come to nearly the same amount as formerly, if a horse were entered in two or more classes. The breeding section of the horse classes would be considerably relieved by the adoption of the proposed revision of entry fees.

Mr. HARRISON could not agree with the remarks made by Mr. Parker, Mr. Stratton, and Mr. Palmer. He was as great an economist as any of these gentlemen, but he thought the request of the Stock Prizes Committee was entirely in the right direction. To increase the prizes and increase the interest taken would certainly add to the success of the Show. The gentlemen who were opposing this increase in the prize sheet should look at the question from the point of view of the success of the Show, both as a national institution and a financial success. He would like to point out that for the Lincoln Show they were going to make economies in the erection of the Showyard, and what the Society had to look at was what the ultimate financial result at Lincoln would be. His own opinion was that they would make a profit at Lincoln. They had made a profit at Derby of over 2,000*l.*, and that was not taking into account the 2,000*l.* credited from the Society's ordinary funds to the Show account. He thought that with every regard to the Finance Committee's recommendation, the request of the Stock Prizes Committee should have some weight with the Members of the Council, and he would most strongly support their application.

After some further discussion, it was, on a show of hands, decided by twenty-three votes to twenty-one to limit the amount to be offered by the Society for prizes in 1907 to 4,000*l.*

The report of the Stock Prizes Committee, with this amendment, was then adopted.

Selection.

Mr. ADEANE reported that to fill the vacancy caused by the retirement of Sir Nigel Kingscote, the Committee recommended the election of Mr. Cornwallis as a Trustee.

On the motion of Mr. ADEANE, the Council unanimously elected Mr. Cornwallis a Trustee of the Society.

Mr. CORNWALLIS said he could not proceed without acknowledging the high compliment the Council had paid him. If he had rendered any services to the Society he had been more than repaid by the kindness and indulgence he had received from every Member of the Council, and their latest compliment was far in excess of anything he deserved.

Farm Prize Competitions.

Sir GILBERT GREENALL reported that the following prizes, amounting to 150*l.*, had been offered by the members of the Belvoir, Brocklesby, Burton, Blankney, and South Wold Hunts, for farms hunted over by these packs:—

	1st £	2nd £	3rd £	4th £
Class I. For farms exceeding 300 acres .	40	25	10	—
Class II. For farms not exceeding 300 acres .	30	20	15	10

(*Entries to close on January* 1, 1907.)

A further sum of 150*l.* had been offered as prizes for farms in Lincolnshire, and it was necessary that these matters should be dealt with immediately. If the Council would agree to accept these prizes, he would move that a Committee be formed to make the necessary arrangements.

Mr. CRUTCHLEY said that before the question was put he would like to point out that, so far as he could remember, the judging of Farm Prize Competitions was a very expensive matter, and he presumed that the

whole cost of the judging would fall upon the Society.

Mr. HARRISON explained that all the expenses of judging would be met from outside, and that the Society would be put to no expense whatever.

These offers were accepted, and a Committee, consisting of Sir John Thorold, Sir Gilbert Greenall, Sir Richard Cooper, and Mr. William Harrison was appointed to carry out the necessary arrangements.

WEDNESDAY, DECEMBER 12, 1906.

HELD AT THE HOTEL RUSSELL, LONDON, W.C.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

Report of Finance Committee.

Mr. ADEANE (Chairman) said that the Committee laid before the Council that day a balance-sheet of the Derby Show, and they asked the Council to approve it. The only remark that he had to make was that it was extremely satisfactory. Financially it showed an actual profit to the Society of 2,028*l.*, which, together with the contribution of 2,000*l.* from the ordinary funds of the Society, gave a gross profit of 4,028*l.*, which they would ask the Council to authorise them to put to the Reserve Fund, thereby increasing the general security of the Society. He thought they would all wish to acknowledge on that occasion that these results could not have been obtained had it not been for the energy and enthusiasm of their Honorary Director, Sir Gilbert Greenall.

Botanical and Zoological.

Mr. WHEELER (Chairman) reported that a Memorandum had been received from the Board of Agriculture with reference to American gooseberry mildew. The Committee recommended that a Memorial be sent to the Board of Agriculture urging them to obtain power to deal with outbreaks of disease of plants, and to prohibit the importation or sale of diseased plants or fruits which might spread infection.

This matter had been brought to a head by the reported outbreak of a disease known as American gooseberry mildew, and concerning which a circular had been received from the Board of Agriculture. That circular stated that: "The disease, which is termed American owing to the extensive damage it has done in America, is of a very serious character, and has rendered the culture of gooseberries unprofitable and practically impossible wherever it has appeared." The circular also went on to say that: "During the winter the disease remains dormant, and will not spread from plant to plant. During this period, however, it can be conveyed from one district to another in bushes and stocks. It is clear that enormous and irreparable mischief may be done in this way." He might also add that the disease in spring and summer was dangerous, owing to the spores of this mildew flying about. The Board of Agriculture said that: "There is at present no law dealing with the eradication of the pests of fruit trees in this country." The Botanical Committee were strongly of opinion that there should be some law to enable the Board of Agriculture to deal with outbreaks of this kind. That was the crux of the whole matter, to enable them to deal with outbreaks before the spread of a disease. In the present case there was no great danger, because the outbreak had occurred on land in the occupation of an intelligent farmer, who was quite willing to do all he could to eradicate the disease, and the local authorities were helping him; but they did not know how soon an outbreak might occur on a plantation of an unintelligent man who would do nothing to prevent the spread of the disease. The Board had power to deal with diseases of animals, and it seemed to the Botanical Committee that they ought to have similar powers

to deal with diseases of plants. It would be easier and simpler to deal with diseases of plants than with the diseases of animals, and, in the opinion of the Committee, it was desirable that the Board should obtain power to deal with such matters. It seemed to him that a small Bill giving the Board such power would receive no opposition from any Parties in Parliament.

Selection.

Sir JOHN THOROLD (Chairman) reported that the Earl of Yarborough had expressed his willingness to be nominated as President for the year 1907, and the Committee recommended that his lordship's name would therefore be suggested to the General Meeting of Members, to be held on that day, for election as President of the Society, to hold office until the next ensuing Annual General Meeting.

Sir JOHN THOROLD, in presenting this report, said that he thought he had better explain the reasons which had induced the Committee to recommend the selection of the Earl of Yarborough as President for the ensuing year. They were going into a very large county, and they hoped to get large numbers of people to their Show from all districts of that county, and to do that he thought they were justified in departing from the usual precedent of electing a Member of Council, in suggesting to them the election of the Earl of Yarborough. There was no man in his county who was more popular, and who would do so much to ensure the success of their Show in Lincolnshire. He therefore had much pleasure in proposing that the name of the Earl of Yarborough be suggested to the Annual General Meeting that day as President for the ensuing year.

Thanks to President.

The Earl of ONSLOW said he thought it would be the unanimous feeling of the Society that they should not separate without passing a hearty vote of thanks to their President. (Cheers.) Many distinguished men had filled the office as President of the Society, many of them had been liberal donors to its funds, but he did not think that any President had ever had to face a condition of affairs of the Socicty so difficult as that which had confronted Mr. Cornwallis, and he thought it must have been a matter of very great congratulation to him to see the Society during the past year emerge from that cloud of darkness which had overshadowed it in the few years preceding his term of office. The results of the Show at Derby conclusively proved that the policy which the Society had adopted, and which had been so energetically furthered by Mr. Cornwallis, was the right policy, and the one likely to put the Society once again upon its legs. They had removed during that momentous year from the old premises of Harewood House into new premises, and, although they were not so palatial, they were perfectly adapted to the requirements of the Society. He, therefore, moved a hearty vote of thanks to Mr Cornwallis for his conduct in the Chair, and he ventured to offer, on behalf of himself and of the Society, their cordial congratulation on the manner in which the year had turned out for the Society whilst Mr. Cornwallis had been the distinguished President.

The Right Hon. AILWYN E. FELLOWES had the very greatest pleasure in seconding the vote of thanks proposed by Lord Onslow. It was especially a pleasure to him because Mr Cornwallis was an old personal friend of his, and he thought that his work during the past year was beyond all praise. Many of them had been present at the Farmers' Club dinner the previous evening, and they must have recognised that it was not only the Society that owed him a deep debt of gratitude, but agriculturists all over the kingdom were very grateful to him for his hard work.

The motion, having been put, was carried by acclamation.

Mr. CORNWALLIS said he felt that they had done him far too much honour for any little work that he had been able to do during the past seventeen months. He had only been one oar in the boat, perhaps the stroke oar for the time being, but every member of that boat had rowed with equal vigour and determination to see that the race should be won, and he only hoped that the prophecy which Lord Onslow had

made that the Society saw before it a good sound future might be fulfilled; and if this should be the case it would be because every Member of the Council had put his back into the work, and had loyally supported the President in anything that had been necessary for carrying on what certainly had been arduous work during his period of office. He could not sit down upon that occasion without saying how much the Society owed to Mr. McRow and the staff, who, in spite of great difficulties in moving into their new house, had carried on without hitch the work of the Society during that time.

Proceedings at the Annual General Meeting of Governors and Members,

HELD AT THE HOTEL RUSSELL, LONDON, W.C.,

WEDNESDAY, DECEMBER 12, 1906.

MR. F. S. W. CORNWALLIS (PRESIDENT) IN THE CHAIR.

The Annual General Meeting of the Governors and Members of the Royal Agricultural Society was held at the Hotel Russell, London, W.C., on Wednesday, December 12, 1906, Mr. F. S. W. Cornwallis (President) in the Chair.

PRESENT:

Trustees.—The Earl of Derby, K.G., Lord Middleton, Lord Moreton, Sir John H. Thorold, Bart.

Vice-Presidents.—Rt. Hon. Victor C. W. Cavendish, M.P., Mr. Percy Crutchley, Mr. J. Marshall Dugdale, the Rt. Hon. A. E. Fellowes, the Earl of Jersey, G.C.B.

Other Members of the Council.—Mr. George Adams, Mr. C. R. W. Adeane, Mr. T. L. Aveling, Mr. H. D. Brocklehurst, Mr. T. A. Buttar, Mr. Richardson Carr, Sir R. P. Cooper, Bart., Sir H. F. de Trafford, Bart., Mr. Henry Dudding, Mr. J. T. C. Eadie, Mr. J. Falconer, Mr. Robert Forrest, Mr. J. W. Glover, Mr. R. M. Greaves, Sir Gilbert Greenall, Bart., Mr. J. Harris, Mr. W. Harrison, Mr. J. H. Hine, Mr. R. J. Bayntun Hippisley, Mr. R. W. Hobbs, Mr. J. Howard Howard, Sir C. V. Knightley, Bart., Mr. George Lobb, Mr. W. A. May, Mr. C. Middleton, Mr. Ralph Palmer, Mr. C. M. S. Pilkington, Mr G. G. Rea, Mr. F. Reynard, The Duke of Richmond and Gordon, K.G., Mr. C. C. Rogers, Mr. John Rowell, Mr. W. Scoby, Mr. R. Stratton, Mr. H. Tallent, Mr. George Taylor, and Mr. E. V. V. Wheeler.

Governors.—Sir John Swinburne, Bart., Mr. T. G. Benn, Mr. James Hornsby, Mr. Martin J. Sutton, Mr. Harold Swithinbank.

Members.—Lord Ernest J. Seymour, the Rt. Hon. F. J. Savile Foljambe, the Hon. Claud B. Portman, the Hon. Percy Wyndham, Sir George J. E. Dashwood, Bart., Sir Edmund Verney, Bart., Messrs. John Angus, W. Bainbridge, John Beaulah, Wentworth C. B. Beaumont, M.P., E. E. Bennett, John Benton, George Beveridge, G. B. Blount, Edward Bohane, Lt.-Col. G. J. Fergusson-Buchanan, Messrs. U. R. Burke, A. H. Clark, R. A. Cooper, S. Copeland, W. Crosland, Alex. Cross, R. H. Elliot, John Evens, W. Frankish, the Very Rev. J. Gillespie, LL.D., Messrs. E. H. Godfrey, George Graham, Charles Y. Hewitt, T. A. Huband, John Hughes, M. Hulton-Harrop, Surgeon Lt.-Col. J. Ince, M.D., Messrs. E. A. Lamb, W. Langridge, K. J. J. Mackenzie, F. Miller, E. H. Morris, John Patten, Professor J. Penberthy, Messrs. C. W. Pennell, J. P. Pentelow, T. F. Plowman, W. A. Prout, J. S. Remer, Harold Sessions, G. F. Sheppard, H. M. Simmons, Francis N. Smith, Henry Smith, J. Herbert Taylor, C. W. Tindall, W. M. Tod, Edward Trimen, James G. Unite, Eldred G. F. Walker, Frank P.

Walker, James Watt, A. G. Weigall, J. Welford, J. Bell White, T. P. Wilkes, A. de C. Wilson, W. F. Wilson, Professor J. Wrightson, &c.

The PRESIDENT, in opening the proceedings, expressed the regret of the Council that they were not able to welcome the Members of the Society in the new house they had acquired at 16 Bedford Square. The room there was finished, but owing to the fact that it was a new building it was not sufficiently dry to be used for the purpose. He hoped, however, that on the next occasion the Council might be able to welcome the Members within the walls of their own building. He desired to point out that, at 16 Bedford Square, a room was provided for the use of Members in which they might write letters or read the papers, as was the case formerly at Harewood House. The Report, which was in the hands of those present, gave in full detail the work of the past year. A large part of that work had been based upon the Special Committee's recommendations, which had been adopted by the Council, and practically all of them had been carried out, with the exception of the Conference of Secretaries of Agricultural and Breed Societies (which it was hoped to hold in the spring of next year), and the actual sale of Harewood House. The Council had had every reason to suppose that by the end of September last that house would have been disposed of, but unfortunately at the last moment the negotiations were broken off. He could only assure them that the Council were using every endeavour to dispose of that house at as early a date as possible, and, with a valuable property of the kind, he had every reason to suppose that it would not be long before it was realised.

He pointed out that, in spite of the fact that the Society was at present the owner of two houses, they were living rather more cheaply than when they were the owners of one house only. That was the one note of disappointment that he had to sound. In other respects they might congratulate themselves that the financial position of the Society was more hopeful than it had been when he had taken office seventeen months ago. They had to express their thanks to Sir Gilbert Greenall, the Honorary Director, that they had held a most successful Show at Derby, which had increased the finances of the Society. An equally encouraging feature was the increase of membership during the past year. He wished, however, to repeat what he had said once before, that the future strength of the Society depended upon an increase of membership. At the present time they had approximately 10,000 Members, but he did not think that that was a sufficiently large number for the great Society which represented the agriculture of England, with a little Scotch representation thrown in.

He did not wish to detain them with any remarks of his own because the work was fully set out in the Report, but there were just one or two acknowledgments that he felt he must make on their behalf. The first was that the Society owed a deep debt of gratitude to the Mayor of Derby and to the Lord-Lieutenant of Derbyshire for their generous co-operation and help at a time when that co-operation and help were most needed by the Society. The Society also owed a deep debt of gratitude to the many gentlemen and the influential City Companies who had given them such valuable financial help at a time when it had been extremely valuable to them. It was not necessary for him to mention them by names, for they were set out in the Report which had been circulated. Further, they must also acknowledge the help which had been given to them by the various Breed Societies scattered all over the country, and representing almost every part of England, by the handsome way they had contributed to the prize fund during the past year or two.

Bye-law No. 60 required that the balance-sheet and the report of the auditors should be submitted to the Annual General Meeting for their consideration. As, however, the Society's financial year did not end until December 31, it was impossible to present to that meeting the current year's accounts. Under the circumstances, the balance-sheet for 1905, as published in the last number of the Journal, issued at the beginning of this year,

was formally presented to the Members. With regard to the financial position of the Society, he was happy to be in a position to say that at the close of the current year the Society would be better off by roughly the sum of 5,000*l.* than it was at the end of 1905. The accounts in connection with the Derby Show had been duly audited and were presented to the meeting. In would be observed that the financial result of this most successful Show was a profit of 2,028*l.* 8*s.* 4*d.* It would be seen from the Report of the Council that the present number of Members on the Society's books was 9,620 as against 9,269 when he took office in August, 1905. There had naturally been a great many resignations amongst those Members who resided in the locality of Park Royal, and they had lost a large number of Members this year through deaths, which accounted for the apparently small increase in the membership of the Society. This would be quite understood when he said that during his term of office, 1,023 new Governors and Members had been elected.

Report from the Council.

Sir JOHN SWINBURNE, in moving the adoption of the Report, was sorry to say that, living in the North of England, he had not had very much time to give proper attention to all the matters referred to therein. He took the opportunity, however, to mention that, in his opinion, it would conduce very much indeed to the comfort of visitors, and also increase the number of people attending the Show, if more facilities were given for circulating round the Showyard. He might mention that he had been present at the Manchester meeting a few years ago. It was a very hot day, and the Showyard was almost half a mile in length, and before visitors arrived at the particular spot they desired to go to they were pretty well roasted. This year at Derby a very heavy rain came on, and one day of the week the ground was in such a bad state that the mud was over the tops of one's boots. He suggested that a single line of horse trams should run right round the Showyard. There were five railway companies running into Derby, and he was sure that there would be no difficulty about obtaining sleepers to construct the line. It would only be necessary to have one track round the yard. He believed that if this suggestion were adopted it would increase the attendance at the Show, and consequently the financial result from the gate money would be very much increased. He took the opportunity of mentioning the matter at that meeting, because it took a considerable amount of time to arrange these matters if they were to be done profitably and at a small cost.

Mr. W. A. PROUT, in seconding the motion, said it seemed to him the most satisfactory Report that had been presented to the Members for many years.

The Report of the Council was then adopted.

Election of President.

The Right Hon. F. J. SAVILE FOLJAMBE moved: "That the Earl of Yarborough be elected President of the Society to hold office until the next ensuing Annual General Meeting." Having had an intimate acquaintance with three generations of the family, he felt that he could speak from his heart as to Lord Yarborough's qualifications to fill the Presidency of the Society. His lordship was the possessor of an acreage larger than many counties, and on that acreage he had the finest lot of tenantry in England. It was almost within his recollection that two great breeds had been introduced to the notice of farmers; he meant the Lincoln sheep, of which the largest breeder was present in that room—and he believed he was a tenant or neighbour of Lord Yarborough—and the breed of Red Shorthorns. These had been born and nurtured on his lordship's property. The present Lord Yarborough had very great business qualifications, and he had the greatest confidence and pleasure in proposing his election as President of the Society.

Mr. C. W. TINDALL, in seconding the motion, said that it would be a source of the greatest satisfaction to the tenant-farmers of Lincolnshire and to the city of Lincoln to know that Lord Yarborough had been elected President of the Society. It was a matter

of gratification that the President should have been chosen from amongst them.

The resolution was then put to the meeting and carried unanimously.

The Earl of YARBOROUGH, in response, said that no words of his could adequately express his feelings on that occasion. To have the honour of occupying the position to which he had just been elected was one of which any man might be justly proud. He could assure them that he appreciated to the fullest extent the honour which they had done him, and he begged to acknowledge the more than kind terms in which the mover and seconder of the resolution had proposed it to the meeting. He might count them both as old personal friends, and therefore they had been prompted rather by kindly feelings towards himself than by actual facts in what they had said. He knew that it had been the usual practice for the President to be selected from those serving on the Council, and he should be the last to believe that they had been prompted to depart from that practice by any personal virtues of his own ; but he thought they had been influenced, in view of the Royal Agricultural Society going to Lincoln next year, to select a President who had an interest in the county entertaining the Royal. He thought that it would be appreciated throughout Lincolnshire as a very great compliment. The Mayor of Lincoln and the Committee that were working with him would have very full support from the county, and he was sure that if any further incentive were required they had supplied it by the graceful compliment which had been paid to them by electing a Lincolnshire man as President next year. He thanked them sincerely for the honour which they had done him.

Election of Trustees, Vice-Presidents, and Auditors.

The Trustees and Vice-Presidents having been re-elected by show of hands, Mr. John Evens moved that the best thanks of the meeting be tendered to Mr. Jonas M. Webb, Mr. Hubert J. Greenwood, and Mr. Newell P. Squarey, for their services as Auditors during the past year, and that they be re-elected to hold office until the next ensuing Annual General Meeting. They had discharged their duties very satisfactorily, and the best proof that could be offered to them in that case was that they should be re-elected for the coming year.

Mr. S. COPELAND had great pleasure in seconding the motion. He was pleased to know that the Auditors' duties would be more happy in the future than they had been in the past.

The resolution was passed unanimously.

Elections to the Council.

The PRESIDENT said that under Bye-law 82 the whole of the new Council elected last year retained office until that meeting, when the "Member or Members elected by each of the divisions in such one of the groups of Divisions A, B, and C respectively as shall be determined by the Council (by ballot or otherwise) shall retire." A second group would retire at the Annual General Meeting in December, 1907, and the remaining group at the Annual General Meeting in 1908. The Council had accordingly determined by ballot that the representatives of the various divisions should retire in the following order :—Group C at the present meeting ; group B at the General Meeting in December, 1907 ; and Group A at the General Meeting in December, 1908.

The necessary steps had been taken to fill the vacancies on the Council in the representation of the Districts in Group C, and he, as President, had to report formally to the Annual General Meeting the names and addresses of the Ordinary Members of Council who had been elected by the sixteen divisions of Group C, in order that the meeting might "take cognisance" of their election.

These names and addresses were as follows :—

Adams, George, Royal Prize Farm, Faringdon, Berkshire.
Adeane, Charles R. W., Babraham Hall, Cambridge, Cambridgeshire.
Aveling, Thomas L., Boley Hill House, Rochester, Kent.
Brocklehurst, Henry Dent, Sudeley Castle, Winchcombe, Gloucestershire.
Carden, Richard George, Fishmoyne, Borrisoleigh, Tipperary, Ireland.
Dudding, Henry, Riby Grove, Stallingborough, Lincolnshire.

Forrest, Robert,, St. Fagan's, Cardiff, Glamorganshire.
Glover, James W., 12 Jury Street, Warwick, Warwickshire.
Greaves, R. M., Wern, Portmadoc, North Wales.
Harris, Joseph, Brackenbrough Tower, Carlisle, Cumberland.
Hippisley, R. J. Bayntun, Ston Easton Park, Bath, Somerset.
Hobbs, Robert W., Kelmscott, Lechlade, Oxfordshire.
Ingram, Walter F., 2 St. Andrew's Place, Lewes, Sussex.
Plumptre, H. Fitzwalter, Goodnestone, Dover, Kent.
Reynard, Frederick, Sunderlandwick, Driffield, Yorkshire, East Riding.
Richmond and Gordon, Duke of, K.G., Goodwood, Chichester, Sussex.
Rowell, John, Bury, Huntingdon, Huntingdonshire.
Wilson, Christopher W., Rigmaden Park, Kirkby Lonsdale, Westmorland.

Suggestions of Governors and Members.

In response to the usual inquiry from the Chair as to whether any Governor or Member had any remark to make or suggestion to offer that might be referred to the Council for their consideration,

Mr. ELDRED WALKER said that on behalf of a large number of cider makers he desired to ask the Royal Agricultural Society to join in a movement in which they were all interested in the West of England. In that part of the country 80 per cent. of the farmers were interested in cider and the growing of apples, and at the present moment they were suffering under great disabilities. One of these was the gross "faking" of cider by the addition of salicylic acid, which was deleterious to health. They wanted the Board of Agriculture to define what cider was, and steps had been taken to organise a deputation to the Board of Agriculture. He asked, on behalf of the West of England cider makers, that the Royal Agricultural Society would join them in the deputation.

Mr. JAMES WATT asked if the Council would consider the question of railway rates for all those who were engaged in connection with the annual Shows. He understood that those Members who visited the Show at Derby had the privilege of obtaining return tickets at a single fare and a quarter from various parts of England, but those who helped to make the Show had no advantage given to them. The privilege ought to be extended to exhibitors and their assistants. They might take their cue from the Highland and Agricultural Society of Scotland, where the railway companies were very good to everybody connected with the Show, issuing return tickets at single fare; and he believed the English companies would follow suit if they were sufficiently pressed.

The Very Rev. Dr. JOHN GILLESPIE said he had ventured to bring this matter of railway facilities before the General Meeting of Members at the last Park Royal Show a year and a half ago, and he had not heard that anything had been done in the matter. If they were as persistent with the English companies as the Highland Society had been with the Scottish railways, he was sure that the privileges would be granted.

Mr. JAMES FALCONER was very glad that Mr. Watt and Dr. Gillespie had brought this matter up. He hoped the Council would give the railway companies no rest until they granted to their Society the same facilities as were afforded by the Scottish railways.

The PRESIDENT pointed out that this matter had not been lost sight of, and that the Society were working in co-operation with the Committee of the Federation of Lancashire Agricultural Societies, of which Mr. Cavendish was Chairman.

Mr. ELDRED WALKER said he had one other suggestion to make, and that was that the Press view of the Showyard should take place on the day previous to the opening of the Show, instead of in the week before, as formerly. It was impossible for men to come a long railway journey to spend an hour or two in the Showyard several days before the Show, and he was sure they would get a larger attendance if the visit were fixed for the day before the Show actually opened.

Mr. ROBERT H. ELLIOT suggested that the Society should impress upon the Government the necessity for having one seed-testing station in Great Britain. This matter had been brought before the Government some years ago, when a Departmental Committee had been appointed, but no action had been taken in the matter. He might say that even in Ireland they had a

seed-testing station which was more than they had in Great Britain.

The PRESIDENT said that a note had been taken of all the suggestions which had been made, and that they would receive the attention of the Council in due course.

Vote of thanks to the President.

The Very Rev. Dr. GILLESPIE proposed a hearty vote of thanks to the retiring President. (Cheers.) There were several circumstances which made his services more valuable at the present time. He had taken hold of the Society when the ship was in very troubled waters, and had steered it so successfully with the aid of the Council that it was at the present time in pretty smooth waters. The Society owed a deep debt of gratitude to Mr. Cornwallis for the energy and tact with which he had carried out the duties of his office. The team he presided over had a considerable number of new horses during the year, and he desired to congratulate the retiring President on the way the work had been carried out, without having any kicking over the traces on the part of the new Members of the team. He was sure the Members of the Society all appreciated in a high degree the exceptional circumstances of Mr. Cornwallis's services during the past year.

Mr. WENTWORTH C. B. BEAUMONT, M.P., in seconding this resolution, said that Mr. Cornwallis had taken office at a time when the Society was certainly in somewhat low water, and his position during the time that he occupied the Presidency, which post he had held for a longer period than any preceding President, was certainly no sinecure. He had had a great deal of hard work to do during his term of office, and he had got the Society out of the low water and out of trouble, and he (Mr. BEAUMONT) thought that Lord Yarborough and future Presidents would have great cause to thank Mr. Cornwallis.

Dr. GILLESPIE then put the motion to the meeting, and it was carried by acclamation.

Mr. CORNWALLIS thought that Dr. Gillespie and Mr Beaumont had quite over-estimated any services which he had been able to render the Society. He could only say that he could wish for no greater honour than to be included amongst the list of Presidents of the Royal Agricultural Society, and if during his year of office in that capacity he had helped the Society in any way, he could only say that it had been one of the most pleasant years of his life. He had received the greatest possible kindness from every Member of the Council. One and all of them had determined that the Society should proceed, if work was able to do it, and he felt that in handing over his duties to such a capable successor as Lord Yarborough, the Society would go on and flourish, and he had no fear that any troubles—financial or otherwise—would affect the future of their great Society.

The work that fell upon the Council was only a portion of the task. The real hard work fell upon the staff, the head of which was Mr. McRow, who had rendered such devoted service to the Society. Mr. McRow gave that service to the Society out of the fulness of his heart, and no effort was spared on his part to do anything to secure progress; and that energy and enthusiasm had infected the whole of the staff. He thanked them very heartily for originally electing him their President, and also for the kind way in which they had recognised his humble services in that capacity.

The proceedings then terminated.

DERBY MEETING.

JUNE 27 TO 30, 1906.

PRESIDENT :

F. S. W. CORNWALLIS, Esq., Linton Park, Maidstone.

OFFICIALS :

Honorary Director.

SIR GILBERT GREENALL, Bart., Walton Hall, Warrington.

Stewards of Live Stock.

FREDERICK REYNARD, Sunderlandwick, Driffield.
JOHN ROWELL, Bury, Huntingdon.
R. M. GREAVES, Wern, Portmadoc.
W. F. INGRAM, 2 St. Andrew's Place, Lewes.
E. VINCENT V. WHEELER, Newnham Court, Tenbury.
J. MARSHALL DUGDALE, Llwyn, Llanfyllin, S.O.

Stewards of Implements.

R. NEVILLE GRENVILLE, Butleigh Court, Glastonbury.
CLAUDE M. S. PILKINGTON, Wollaton, Nottingham.

Steward of Dairying.

ERNEST MATHEWS, Little Shardeloes, Amersham, Bucks.

Steward of Forage.

JOHN T. C. EADIE, The Knowle, Hazelwood, Derby.

Stewards of Refreshments.

T. L. AVELING, Boley Hill House, Rochester.
WILLIAM HARRISON, Hall House, Leigh, Lancs.

Steward of Agricultural Education and Forestry Exhibition.

J. BOWEN-JONES, St. Mary's Court, Shrewsbury.

Stewards of Finance.

SIR RICHARD P. COOPER, Bart., Shenstone Court, Lichfield.
RICHARDSON CARR, Estate Office, Tring Park, Herts.

Secretary.

THOMAS MCROW, 16 Bedford Square, London, W.C.

JUDGES OF IMPLEMENTS.

Suction Gas Plants.

Capt. H. R. SANKEY, 7 Dean's Yard, Westminster, S.W.
Professor W. E. DALBY, Central Technical College, Exhibition Road, London, S.W.

Miscellaneous Implements entered for Silver Medals.

BAYNTUN HIPPISLEY, Ston Easton Park, near Bath.
THOMAS STIRTON, Rendlesham Estate Office, Woodbridge.

JUDGES OF STOCK, &c.

(*As finally corrected.*)

HORSES.

Hunters.—*Classes* 1-8, and 41-46 ; and **Polo Ponies.**—*Classes* 9-13, 47 and 48.

W. A. HARFORD, Petty France, Badminton, S.O., Glos.
T. WICKHAM BOYNTON, Burton Agnes Hall, Driffield.

Cleveland Bays.—*Classes* 14-16.

JOSEPH SHEPHERD, Prospect House, Sadberge, Darlington.

Coach Horses.—*Classes* 17-19.

GEORGE BURTON, Thorpe Willoughby, Selby.

Hackneys and Ponies.—*Classes* 20-36 ; **and Harness Horses.**—*Classes* 49-59.

A. W. HICKLING, Adbolton, Nottingham.
J. D. ROBINSON, Warren Farm, Sledmere, York.

Shetland, Mountain and Moorland Ponies.—*Classes* 37-40.

Capt. WENTWORTH HOPE JOHNSTONE, Polebrook, Eden Bridge.

Shires.—*Classes* 60-69.

JAMES GOULD, Model Farm, Lymm.
F. W. GRIFFIN, Boro' Fen, Peterborough.

Clydesdales.—*Classes* 70-75.

WM. TAYLOR, Park Mains, Renfrew.

Suffolks.—*Classes* 76-81.

J. J. HORNBY, Knowsley, Prescot.
S. R. LIVINGSTONE LEARMONTH, Stakes, Waterloo Ville, Hants.

Agricultural Horses.—*Classes* 82-84.

F. W. GRIFFIN, Boro' Fen, Peterborough.
WM. TAYLOR, Park Mains, Renfrew.

ASSES.

Classes 85 and 86.

JOHN RIPLEY, Barston House, South Cerney, Cirencester.

CATTLE.

Shorthorns.—*Classes* 87-93.

JAMES PETER, Berkeley Castle Estate Office, Glos.
C. W. BRIERLEY, The Firs, Brimfield.

Dairy Shorthorn Cows and Heifers.—*Classes* 94-96.

J. C. ROBINSON, Iford, Lewes.

Lincolnshire Red Short-horns.—*Classes* 98-104.

FRED SCORER, Whitehall, Bracebridge Heath, Lincoln.

Herefords.—*Classes* 106-111.

W. THOMAS, The Hayes, Sully, Barry.
J. W. MILLYARD, Littlebridge, Bromyard.

Devons.—*Classes* 112-117.

C. L. HANCOCK, The Manor House, Cothelstone, Bishop's Lydeard.

South Devons.—*Classes* 118 and 119.

WM. MERRY, Woodford, Plympton.

Sussex.—*Classes* 121-126.

DANIEL SWAFFER, Mumford, Kingsnorth, Ashford, Kent.

Welsh.—*Classes* 127-130.

RICHARD W. PRITCHARD, Coedmarion, Carnarvon.

Red Polled.—*Classes* 131-136.

A. D. BRUCE, Estate Office, Elvetham Park, Winchfield.
HERBERT BLOFIELD, Morley Manor, Wymondham.

Aberdeen Angus.—*Classes* 138-143.

W. S. FERGUSON, Pictstonhill, Perth.
C. STEPHENSON, Sandyford Villa, Newcastle-on-Tyne.

Galloways.—*Classes* 144-147.

ROBERT SHENNAN, Balig, Kirkcudbright.

Highland.—*Classes* 148 and 149.

R. MACDIARMID, Castles, Lochawe, Argyll.

Ayrshires.—*Classes* 150 and 151.

MATTHEW HUNTER, Adamhill, Craigie, Kilmarnock.

Jerseys.—*Classes* 153-158.

JOHN KEDDIE, Royalcot, Stansted.
HERBERT PADWICK, The Manor House, West Thorney, Emsworth.

Guernseys.—*Classes* 160-165.

G. TITUS BARHAM, Sudbury Park, Wembley.
JOHN LE PAGE, Le Briquet, St. Saviour's, Jersey.

Longhorns.—*Classes* 167-170.

NIGEL J. C. NEVILLE, Rhyl Manor, Dulverton.

Kerry and Dexter.—*Classes* 172-178.

G. F. ROUMIEU, Bethune House, Farnham.
F. N. WEBB, Babraham, Cambridge.

SHEEP.

Oxford Downs.—*Classes* 182-185.

JOHN BRYAN, Southleigh, Witney.

Shropshires.—*Classes* 186-192.

W. BARRS, Tempe, Measham, Atherstone.
S. F. M. NEVETT, Yorton, Shrewsbury.

Southdowns.—*Classes* 193-198.

HUGH PENFOLD, Moat Farm, Marston, Ampthill.
F. H. JENNINGS, Cockfield Hall, Bury St. Edmunds.

Hampshire Downs.—*Classes* 199-203.

T. A. EDNEY HAYTER, The Mount, Whitchurch, Hants.
J. B. STEVENS, The Manor, Ogbourne St. George, Wilts.

Suffolks.—*Classes* 204-209.

J. W. EAGLE, The Hall, Walton-on-Naze.

Lincolns.—*Classes* 210-215.

HENRY GOODYEAR, Austerby, Bourne.
JAMES CARTWRIGHT, Pillar Farm, Nocton, Lincoln.

Leicesters.—*Classes* 216-219.

WILLIAM MARSHALL, Cottam House, Driffield.

Cotswolds.—*Classes* 220-223.

T. S. TAYLER, Idstone, Shrivenham.

Border Leicesters.—*Classes* 224-227.

J. R. C. SMITH, Mowhaugh, Yetholm.

Kent or Romney Marsh.—*Classes* 228-232.

F. AUSTEN BENSTED, The Lawn, Sittingbourne.

Wensleydales.—*Classes* 233-236.

AARON EWAN, Gooda, Westhouse, Kirkby Lonsdale.

Dorset Horn.—*Classes* 237-240.

SAMUEL KIDNER, Bickley, Milverton.

Devon Long Wool.—*Classes* 241-243.

C. L. HANCOCK, The Manor House, Cothelstone, Bishop's Lydeard.

South Devons, Dartmoors and Exmoors.—*Classes* 244-249.

WM. MERRY, Woodford, Plympton.

Cheviots.—*Classes* 250 and 251.

J. R. C. SMITH, Mowhaugh, Yetholm.

Black-faced Mountain.—*Classes* 252 and 253.

R. MACDIARMID, Castles, Lochawe, Argyll.

Lonks and Herdwicks.—*Classes* 254-257.

GEORGE BARCROFT, Scout Moor, Shuttleworth, Manchester.

Welsh Mountain.—*Classes* 258 and 259.

RICHARD W. PRITCHARD, Coedmarion, Carnarvon.

Ryeland.—*Classes* 259a-261.

J. H. YEOMANS, Withington, Hereford.

PIGS.

Large Whites.—*Classes* 262-266.

H. H. OWTRAM, Newland Hall, Ellel, Lancaster.

Middle Whites.—*Classes* 267-271.

JOSEPH ASHFORTH, Dronfield, Sheffield.

Berkshires.—*Classes* 272-276.

A. S. GIBSON, The Elms, Ruddington, Nottingham.

Tamworths.—*Classes* 277-281.

Lt.-Col. F. A. Walker-Jones, The Manor House, Burton, Westmorland.

Large Blacks.—*Classes* 282-285.

S. R. Sherwood, Playford, Ipswich.

POULTRY.

Classes 286-393.

P. Proud, Birkdale, Southport.
J. P. W. Marx, Basford, Nottingham.
H. Abbot, Thuxton, Norfolk.

PRODUCE.

Butter.—*Classes* 394 and 395.

Thomas Latham, Dorchester, Oxon.

Cream and Cheese—*Classes* 396-404.

Professor H. J. Drummond, Dairy School, Kilmarnock.

Cider and Perry.—*Classes* 405-408.

John Ettle, Stanley Grove Road, Weston-super-Mare.

Wool.—*Classes* 409-417.

Fred C. Collins, 1 Duke Street, Cheapside, Bradford.
Thomas Musgrave, Manby House, Otley.

Hives and Honey.—*Classes* 418-441.

W. F. Reid, Fieldside, Addlestone, Surrey.
P. Scattergood, Gladwin House, Stapleford, Notts.
T. I. Weston, Dorchester Road, Hook, Hants.

COMPETITIONS.

Horse-jumping.

Walter C. Tinsley, Mayfield, Ashbourne.
Gerald H. Hardy, Foston Hall, Derby.
E. W. Griffith, Plasnewydd, Trefnant, R.S.O.
Richard Fort, King's Standing, Burton-on-Trent.
H. Boden, The Friary, Derby.

Horse-shoeing.

F. W. Wragg, F.R.C.V.S., 17 Church Lane, Whitechapel, E.
John Thirtle, R.S.S., 109 St. Albans Avenue, Bedford Park, W.

VETERINARY INSPECTORS.

John Malcolm, F.R.C.V.S., Holliday Street Wharf, Birmingham.
Professor J. Penberthy, F.R.C.V.S., Royal Veterinary College, Camden Town, N.W.
Professor J. Macqueen, F.R.C.V.S., Royal Veterinary College, Camden Town, N.W.
William Hunting, F.R.C.V.S., 16 Trafalgar Square, Chelsea, S.W.
Henry G. Lepper, M.R.C.V.S., Aylesbury.
Harry Moore, M.R.C.V.S., Potter Street, Worksop.
George Wartnaby, M.R.C.V.S., Primrose Hill, Burton-on-Trent.
F. W. Wragg, F.R.C.V.S., 17 Church Lane, Whitechapel, E.

AWARDS OF PRIZES AT DERBY, 1906.

ABBREVIATIONS.

I., First Prize. II., Second Prize. III., Third Prize. IV., Fourth Prize.
R. N., Reserve Number. H. C., Highly Commended.

N.B.—The responsibility for the accuracy of the description or pedigree, and for the eligibility to compete of the animals entered in the following classes, rests solely with the Exhibitors.

Unless otherwise stated, each Prize Animal in the Classes for Horses, Cattle, Sheep, and Pigs was "bred by Exhibitor."

HORSES.

Hunters.

No. in Catalogue.

Class 1.—*Hunter Mares, with Foals at foot, 13 stone and upwards.* [12 entries, 3 absent.]

7 **I.** (£10, & R. N. for Champion.[1])—E. W. ROBINSON, Brookleigh, Esher, for **Golden Leaf** 2896, chestnut, foaled 1894 [foal *by* Riverstown], bred by M. D. Peacock, Manor House, Middleham, R.S.O.; *s.* Tertius, *d.* Golden Fringe *by* Discord.

12 **II.** (£6.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for **Glasspore** 2889, chestnut, foaled 1895 [foal *by* Squadron Leader], bred by John Watson, Waresly Stud, Kidderminster; *s.* Glasshampton, *d.* Extempore *by* Highborn.

4 **III.** (£4.)—J. A. MULLENS, Barrow Hills, Longcross, for **Secret Sign**, black-brown, foaled 1897 [foal *by* Revenue], bred by E. H. House, Tomson House, near Blandford: *s.* Freemason, *d.* Phœbe *by* Statesman.

9 **R. N. & H. C.**—R. B. TENNENT, Fairfield, Buxton, for **Birch Rod.**

Class 2.—*Hunter Colt or Filly Foals, the produce of mares exhibited in Class* 1.[2] [6 entries, 2 absent.]

13 **I.** (£10.)—C. H. DIXON, Stretton Hall, Leicester, for colt; *s.* Fowling Piece, *d.* Alice *by* Brown Prince. [*Exhibited with No.* 2.]

14 **II.** (£6.)—J. A. MULLENS, Barrow Hills, Longcross, for bay filly; *s.* Revenue, *d.* Secret Sign *by* Freemason. [*Exhibited with No.* 4.]

16 **III.** (£4.)—E. W. ROBINSON, Brookleigh, Esher, for bay colt; *s.* Riverstown, *d.* Golden Leaf *by* Tertius. [*Exhibited with No.* 7.]

15 **R. N. & H. C.**—MRS. RATCLIFF, Stanford Hall, Loughborough, for colt. [*Exhibited with No.* 5.]

Class 3.—*Hunter Fillies, foaled in* 1903. [6 entries, 1 absent.]

21 **I.** (£10.)—J. A. MULLENS, Barrow Hills, Longcross, for **Paleface**, chestnut, bred by D. Christy, Margaretting Hall, Ingatestone; *s.* Ringoal, *d.* Margaret.

23 **II.** (£6.)—J. H. STOKES, Nether House, Gt. Bowden, Market Harborough, for **Black Pearl**, black, bred by T. B. Newton, Gilling Grange, Richmond, Yorks.; *s.* Knight of Ruby.

22 **III.** (£4.)—C. W. JERVIS SMITH, Brocksford Hall, Doveridge, Derby, for **Miss Brown**, brown; *s.* Rampion, *d. by* Brown Prince.

19 **R. N. & H. C.**—C. H. DIXON, Stretton Hall Leicester, for **The Squaw.**

Class 4.—*Hunter Fillies, foaled in* 1904. [11 entries, 1 absent.]

27 **I.** (£10, & R. N. for Champion.[3])—EDWARD HODGSON, The Hollows, Bridlington, for **Daisy**, chestnut; *s.* Red Prince 2nd, *d.* Faithful *by* Gooseberry.

29 **II.** (£6.)—GEORGE JINKS, Hill Farm, Sheepy, Atherstone, for **Empress**, chestnut; *s.* Barsac, *d.* Horncastle *by* General Roberts.

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[1] Gold Medal, value £10 10*s.*, given by the Hunters' Improvement Society, for the best Hunter Mare four years and upwards, registered or entered in the Hunter Stud Book.

[2] Prizes given by the Derby Local Committee.

[3] Gold Medal, value £10 10*s.*, given by the Hunters' Improvement Society, for the best Hunter Filly not exceeding three years old, registered or entered in the Hunter Stud Book.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

31 **III.** (£4.)—LORD MIDDLETON Birdsall House, York, for **Symphony,** chestnut; *s.* Red Eagle, *d.* Sympathy *by* Gordon.

26 **R. N. & H. C.**—THE EARL OF HARRINGTON, Elvaston Castle, Derby.

Class 5.—*Hunter Fillies, foaled in* 1905. [6 entries, none absent.]

38 **I.** (**£10, & Champion.**[1])—LORD MIDDLETON, Birdsall House, York, for bay; *s.* Wales, *d.* Madame Modjeska *by* Gordon.

36 **II.** (**£6.**)—EDWARD HODGSON, The Hollows, Bridlington, for **Mab,** bay; *s.* Pax, *d.* Faithful *by* Gooseberry.

37 **III.** (£4.)—LORD MIDDLETON, for bay or brown; *s.* Red Eagle, *d.* Betty *by* Gordon.

40 **R. N. & H. C.**—W. B. SWALLOW, Wootton Lawn, Ulceby, for **Alpha.**

Class 6.—*Hunter Geldings, foaled in* 1903.[2] [7 entries, 1 absent.]

46. **I.** (**£10.**)—LORD MIDDLETON, Birdsall House, York, for **Scrambler,** bay; *s.* Red Eagle, *d.* Scornful *by* Gordon.

48 **II.** (**£6.**)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for **Destruction,** chestnut, bred by G. Waddington, Cotham, Newark; *s.* Havoc, *d.* Madge.

44 **III.** (£4.)—EDWARD HODGSON, The Hollows, Bridlington, for **Sportsman,** grey, bred by F. J. Grainger, Boston Spa; *s.* Wales, *d.* Lady Greylock *by* Blacklock.

47 **R. N. & H. C.**—THE HON. ALEXANDER PARKER, Doveridge, Derby.

Class 7.—*Hunter Geldings, foaled in* 1904.[2] [9 entries, 2 absent.]

56 **I.** (**£10.**)—J. H. WATSON, Green Hill, Kidderminster, for **Juggler,** chestnut, breeder unknown.

54 **II.** (**£6.**)—W. B. SWALLOW, Wootton Lawn, Ulceby, for **Red Morn,** chestnut; *s.* Red Eagle, *d.* Beatrice *by* Horizon.

55 **III.** (£4.) W. B. SWALLOW, for **Vigo,** brown; *s.* Congo, *d.* Victoria *by* Gilderroy.

57 **R. N. & H. C.**—F. B. WILKINSON, Edwinstowe, Newark, for **The Colonel.**

Class 8.—*Hunter Colts or Geldings, foaled in* 1905.[2] [7 entries, none absent.]

61 **I.** (**£10.**)—J. L. NICKISSON, Hinton Manor, Swindon, for **Ensign,** chestnut colt; *s.* Yard Arm, *d.* Goodcraft *by* King Crafty.

64 **II.** (**£6.**)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for **His Grace,** chestnut colt, bred by G. Waddington, Cotham, Newark; *s.* Erskine, *d.* Madge.

60 **III.** (£4.)—GEORGE JINKS, Hill Farm, Sheepy, Atherstone, for **Barsac 2nd,** bay colt; *s.* Barsac, *d.* Horncastle *by* General Roberts.

58 **R. N. & H. C.**—DR. BENSON, Hockley House, Ashover, Chesterfield, for **Battle Axe.**

Polo and Riding Ponies.

Class 9.—*Polo and Riding Pony Stallions, foaled before or in* 1903, *not exceeding* 14 *hands* 2 *inches.* [6 entries, none absent.]

67 **I.** (**£10, & Champion.**[3])—THE RADNORSHIRE POLO & RIDING PONY CO., LTD., The Farm, Bleddfa, Llangunllo, R.S.O., for **Gownboy** 114, chestnut, foaled 1896, bred by S. Hughes Hewitt, Sports Club, London; *s.* Montezuma, *d.* Santa Zita *by* Galliard.

69 **II.** (**£6, & R. N. for Champion.**[3])—C. HOWARD TAYLOR, Middlewood Hall, Barnsley, for **Marechal Niel,** chestnut, foaled 1902, bred by G. Norris Midwood, The Grange, North Rode, Congleton; *s.* Rosewater 37, *d.* Fine Fleur 614 *by* Wildair.

66 **III.** (£4.)—JOHN BELL, Upend, Newmarket, for **Corner Boy,** chestnut, foaled 1899, bred by J. C. Sullivan; *s.* Dare Devil, *d.* Idleband *by* Saraband.

68 **R. N. & H. C.**—JAMES B. SCOTT, Bearhouse Stud Farm, Lapworth, for **Brigand.**

Class 10.—*Polo and Riding Pony Mares, with Foals at foot, not exceeding* 14 *hands* 2 *inches.* [7 entries, none absent.]

74 **I.** (**£10, & Champion.**[4])—MISS L. STANDISH, Marwell Manor, Eastleigh, Hants, for **Silver Star** 1020, bay, foaled 1894 [foal *by* Rupert 308], bred by G. Hutchings, Claremont, Paignton; *s.* Knight of the Laund, *d. by* Acrobat.

71 **II.** (**£6, & R. N. for Champion.**[4])—JOHN BARKER, M.P., The Grange, Bishop's Stortford, for **Wembley** 1469, bay, aged [foal *by* Sandiway 121], breeder unknown.

72 **III.** (£4.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Early Dawn,** chestnut, aged [foal *by* Bold Marco], breeder unknown.

76 **R. N. & H. C.**—C. HOWARD TAYLOR, Middlewood Hall, Barnsley, for **Grey Wings.**

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[1] Gold Medal, value £10 10*s.*, given by the Hunters' Improvement Society for the best Hunter Filly not exceeding three years old, registered or entered in the Hunter Stud Book.

[2] Prizes given by the Derby Local Committee.

[3] Gold Medal given by the Polo and Riding Pony Society for the best Polo and Riding Pony Stallion or Colt in Classes 9, 12 and 13.

[4] Gold Medal given by the Polo and Riding Pony Society for the best Polo and Riding Pony Mare or Filly in Classes 10—13.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 11.—*Polo and Riding Pony Geldings or Fillies, foaled in* 1903, *not exceeding* 14 *hands* 1½ *inches.*[1] [6 entries, 1 absent.]

82 **I.** (£10.)—G. NORRIS MIDWOOD, The Grange, North Rode, Congleton, for **North Rode Fawn**, brown filly ; *s.* Lo Ben 223, *d.* Gilly 950.

80 **II.** (£6.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Rachael**, brown filly, bred by John Barker, M.P., The Grange, Bishop's Stortford ; *s.* Mark For'ard, *d.* Jew 631 *by* Pearl Diver.

79 **III.** (£4.)—JOHN BARKER, M.P., The Grange, Bishop's Stortford, for **Gold**, brown gelding ; *s.* Sandiway 121, *d.* Tita 1465.

78 **R. N. & H. C.**—JOHN BARKER, M.P., for **Flo.**

Class 12.—*Polo and Riding Pony Colts, Geldings, or Fillies, foaled in* 1904, *not exceeding* 14 *hands* 1 *inch.*[1] [9 entries, none absent.]

84 **I.** (£10.)—JOHN BARKER, M.P., The Grange, Bishop's Stortford, for **Heir**, chestnut gelding, bred by the Rev. D. B. Montefiore and Col. Henriques, Mursley, Winslow ; *s.* Eheu 219, *d.* Girton Girl 952.

91 **II.** (£6.)—THE RADNORSHIRE POLO & RIDING PONY CO., LTD., The Farm, Bleddfa Llangunllo, R.S.O., for **Senior Wrangler**, chestnut colt ; *s.* Gownboy 114, *d.* First Flight 615 *by* Balqudahar.

87 **III.** (£4.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Bouncing Pearl**, chestnut filly ; *s.* Rosewater 37, *d.* Bright Pearl 693 *by* Pearl Diver.

86 **R. N. & H. C.**—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Royal Ivy.**

Class 13.—*Polo and Riding Pony Colts, Geldings, or Fillies, foaled in* 1905, *not exceeding* 13 *hands* 3 *inches.*[1] [7 entries, none absent.]

93 **I.** (£10.)—JOHN BARKER, M.P., The Grange, Bishop's Stortford, for **Grecian**, bay gelding ; *s.* Sandiway 121, *d.* Greek Girl 510 *by* Zenophon.

97 **II.** (£6.)—TRESHAM GILBEY, Whitehall, Bishop's Stortford, for **Bold Ivy**, bay colt, bred by John Barker, M.P., Bishop's Stortford ; *s.* Bold Marco, *d.* Ivy 1399.

94 **III.** (£4.)—JOHN BARKER, M.P., for **Hawksand**, bay colt ; *s.* Sandiway 121, *d.* Hawkweed 2nd 1233 *by* Juval.

99 **R. N. & H. C.**—E. C. MORGAN, Birdsall Grange, York, for **Rowan Berry.**

Cleveland Bays.[2]

Class 14.—*Cleveland Bay Stallions, foaled in* 1903 *or* 1904. [10 entries, 2 absent.]

100 **I.** (£10.)—FRANK BATEMAN, The Lodge, Shinfield, Reading, for **Beadlam Fred**, foaled 1903, bred by George Scoby, Beadlam Grange, Nawton, Yorks. ; *s.* King Fred 1523, *d.* Beadlam Augusta 1175 *by* Lorenzo 1402.

109 **II.** (£6.)—F. H. STERICKER, Westgate House, Pickering, for **Radium**, foaled 1903, bred by George Mortimer, Westerdale, Grosmont ; *s.* Pitch and Toss 1204, *d.* Westerdale Princess 1167 *by* Prince George 235.

103 **III.** (£4.)—THOMAS KNAGGS, Tofts Farm, Marske-by-the-Sea, for **Saltburn Favourite** 1650, foaled 1903 ; *s.* Sparrow Hall Favourite 1561, *d.* Marianne 558 *by* Newton 216.

106 **R. N. & H. C.**—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton Lucks All.**

Class 15.—*Cleveland Bay Mares, with Foals at foot.* [6 entries, none absent.]

113 **I.** (£10.)—GEORGE GRANDAGE, Moor Croft, Yeadon, Leeds, for **Woodland Briar** 1269, foaled 1902 [foal *by* Woodland Pride 1659], bred by F. Wilson Horsfall, Potto Grange, Northallerton ; *s.* King of the East 1525, *d.* Horsfall's Progress 948 *by* Cleveland Park.

112 **II.** (£6.)—GEORGE ELDERS, Toft House Farm, Aislaby, Whitby, for **Aislaby Beauty** 1169, foaled 1900 [foal *by* Prince George 235] ; *s.* Prince George 235, *d.* Hetty 949 *by* Pitch and Toss 1204.

115 **III.** (£4.)—JOHN LETT, Cleveland Stud Farm, Rillington, York, for **Madam 2nd** 977, foaled 1896 [foal *by* Special Delight 2393], bred by H. C. Stephens, Cholderton, Salisbury ; *s.* Lucks All 189, *d.* Madam 70 *by* Fidius Dius 107.

111 **R. N. & H. C.**—FRANK BATEMAN, The Lodge, Shinfield, Reading, for **Woodland Rose.**

Class 16.—*Cleveland Bay Fillies, foaled in* 1903 *or* 1904. [5 entries, 1 absent.]

119 **I.** (£10.)—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton Blossom** 1278, foaled 1904 ; *s.* Wellington 1488, *d.* Sultana 1008 *by* Sultan 667.

120 **II.** (£6.)—H. C. STEPHENS, for **Cholderton Welcome** 1281, foaled 1904 ; *s.* Cholderton Hector 1575, *d.* Miss Welcome 1075 *by* Marston 1080.

117 **III.** (£4.)—GEORGE GRANDAGE, Moor Croft, Yeadon, Leeds, for **Woodland Star**, foaled 1903, bred by F. Wilson Horsfall, Potto Grange, Northallerton ; *s.* Potto Salton 1545, *d.* Darling 532 *by* Fidius Dius 107.

116 **R. N. & H. C.**—GEORGE ALLISON, Hawsker, Whitby, for **Lady Swan.**

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[1] Prizes given by the Polo and Riding Pony Society.

[2] The sum of £30 towards these Prizes was given by the Cleveland Bay Horse Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Coach Horses.[1]

Class 17.—*Coaching Stallions, foaled in* 1903 *or* 1904. [5 entries, none absent.]

125 **I.** (£10.)—F. H. STERICKER, Westgate House, Pickering, for **Granville,** foaled 1904; *s.* Ingmanthorpe Mikado 2224, *d.* Princess Beatrice 933 *by* Lucks All 797.

123 **II.** (£6.)—GEORGE SCOBY, Beadlam Grange, Nawton, Yorks., for **Easingwold,** foaled 1904, bred by J. Tebb, Woodbine Farm, Easingwold; *s.* Lord Risby 1402, *d.* Meg 631 *by* Wonderful Lad 536.

122 **III.** (£4.)—JOHN LETT, Cleveland Stud Farm, Rillington, York, for **Special Brand** 1651, foaled 1903; *s.* Speciality 1562, *d.* Mademoiselle 1133 *by* Lucky Hero 1492.

124 **R. N. & H. C.**—GEORGE SCOBY, for **Prince Fred.**

Class 18.—*Coaching Mares with Foals at foot.* [2 entries, none absent.]

127 **I.** (£10.)—F. WILSON HORSFALL, Potto Grange, Northallerton, for **Perseverance** 840, foaled 1897 [foal *by* Potto Hutton], bred by John Jackson, Lythe, Whitby; *s.* Prince George 367, *d.* Trimmer 2nd 330 *by* Candidate 64.

Class 19.—*Coaching Fillies, foaled in* 1903 *or* 1904. [5 entries, none absent.]

129 **I.** (£10.)—GEORGE GRANDAGE, Moor Croft, Yeadon, Leeds, for **Woodland May,** foaled 1904, bred by E. & T. Harley, Barlby Bank, Selby; *s.* Beacon Prince 2227, *d.* Comus May 941 *by* Willoughby Prince 1523.

130 **II.** (£6.)—JOHN LETT, Cleveland Stud Farm, Rillington, York, for **Madeline,** foaled 1903; *s.* Speciality 2302, *d.* Madam 2nd 814 *by* Lucks All 1114.

131 **III.** (£4.)—GEORGE SCOBY, Beadlam Grange, Nawton, Yorks., for **Lady Hylda,** foaled 1904; *s.* Marquis 2385, *d.* Perseverance 840 *by* Prince George 367.

132 **R. N. & H. C.**—JOHN WEBSTER, Harome, Nawton, for **Harome Bell 2nd.**

Hackneys.[2]

Class 20.—*Hackney Stallions, foaled in* 1903. [8 entries, 1 absent.]

138 **I.** (£15, & **R. N. for Champion.**[3])—RICHARD FORD, Garton, Driffield, for **Brigham Radient** 9142 bay, bred by T. R. Stork, The Manor, Brigham; *s.* Rosador 4964, *d.* Brigham Belle 14955 *by* Revival 7236.

139 **II.** (£10.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Dashing Lad** 9184 chestnut; *s.* Royal Danegelt 5785, *d.* Startle 10532 *by* Success 3rd 4536.

140 **III.** (£5.)—ALFRED A. HALEY, Whitewall, Malton, for **Yorkshire Squire** 9076, chestnut, bred by J. B. Barnard, Moorlands Stud Farm, Haxby; *s.* Rosador 4964, *d.* Princess 10428 *by* Garton Duke of Connaught 3009.

136 **R. N. & H. C.**—STEPHEN CLIFF, Western Flatts, Wortley, Leeds, for **New Gold.**

Class 21.—*Hackney Stallions, foaled in* 1904. [8 entries, 1 absent.]

145 **I.** (£15, & **Champion.**[3])—ARTHUR HALL, Copmanthorpe Grange, York, for **Copmanthorpe Performer,** dark chestnut, bred by George Hall, Bishop Wilton, Wilberfoss, York; *s.* Garton Duke of Connaught 3009, *d.* Copmanthorpe Lily *by* Langton 6078.

144 **II.** (£10.)—R. P. EVANS, Woodhatch House, Reigate, for **Gartonius** 9236, chestnut; *s.* Garton Duke of Connaught 3009, *d.* Julia 11929 *by* Dagenham 4214.

147 **III.** (£5.)—WILLIAM MCALLISTER, The Inverness Hackney Stud, Inverness, for **Dictator of Inverness** 9191, chestnut; *s.* Administrator 8047, *d.* Inverness Duchess, of Connaught 15192 *by* Garton Duke of Connaught 3009.

141 **R. N. & H. C.**—J. G. ATKINSON-JOWETT, Drewton Manor, South Cave, Yorks., for **Drewton Masher.**

Class 22.—*Hackney Stallions, foaled in* 1905. [3 entries.]

149 **I.** (£10.)—THOMAS HALL, Copmanthorpe Grange, York, for **Copmanthorpe,** chestnut; *s.* St. Thomas 7261, *d.* Lady Wymondham 5670 *by* Maywood 2181.

150 **II.** (£6.)—W. R. LYSAGHT, Castleford, Chepstow, for **Chepstow Desmond,** chestnut; *s.* Polonius 4931, *d.* Lady Kate 9122 *by* Evolution 2058.

151 **R. N. & H. C.**—OLIVER RIX, Hill House, Sculthorpe, Fakenham, for **Reformist.**

Class 23.—*Hackney Mares, with Foals at foot, over* 15 *hands* 2 *inches.* [5 entries, 1 absent.]

156 **I.** (£15, & **Champion.**[4])—W. B. TUBBS, The Paddocks, Mill Hill, N.W., for **Rosadora** 11437, chestnut, foaled 1896 [foal *by* Administrator 8047], bred by J. F. Richardson, Norton Lodge, Malton; *s.* Rosador 4964, *d.* Wild Daisy 6311 *by* Wildfire 1224.

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[1] The sum of £30 towards these Prizes was given by the Yorkshire Coach Horse Society.

[2] The sum of £140 towards these Prizes was given by the Hackney Horse Society.

[3] Gold Medal, value £10, given by the Hackney Horse Society for the best Hackney Stallion in Classes 20-22.

[4] Gold Medal, value £10, given by the Hackney Horse Society for the best Hackney Mare or Filly in Classes 23, 24, 26, 27, and 28.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

153 **II.** (£10.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Mitre** 16055, chestnut, foaled 1902 [foal *by* Royal Danegelt 5785], bred by Alfred Craggy, North Newbald, Brough ; *s.* His Majesty 2513, *d.* Anne Boleyn 13229 *by* Demas 6331.

152 **III.** (£5.)—R. A. DE MANCHA, Waterside Stud, Frogmore, St. Albans, for **Bashful Kate** 14914, chestnut, foaled 1901 [foal *by* Garton Duke of Connaught 3009], bred by John Harrison, Garton-on-the-Wolds, Yorks. ; *s.* Rosador 4964, *d.* Modest Kate 5882 *by* Rufus 1343.

154 **R. N. & H. C.**—H. V. SHERINGHAM, South Creake, Fakenham, for **Creake Sylvia.**

Class 24.—*Hackney Mares, with Foals at foot, over* 14 *hands and not exceeding* 15 *hands* 2 *inches.* [7 entries, 2 absent.]

162 **I.** (£15.)—W. R. LYSAGHT, Castleford, Chepstow, for **Maudora** 16010, bay, foaled 1902 [foal *by* Mathias 6473], bred by A. A. Haley, Malton ; *s.* Rosador 4964, *d.* Lady Maude 4150 *by* Pioneer 1088.

161 **II.** (£10.)—R. P. EVANS, Woodhatch House, Reigate, for **B. B. Iris** 12433, chestnut, foaled 1898 [foal *by* Evanthius 8463], bred by Henry Moore, Burn Butts, Cranswick, Hull ; *s.* Chocolate Junior 4185, *d.* Watercress 8568 *by* Lord Derby Junior 3742.

160 **III.** (£5.)—COCKAYNE BROS., Sheffield Lane Paddocks, Sheffield, for **Paddock Queen** 14651, chestnut, foaled 1899 [foal *by* Paddock Polonius 7208] ; *s.* His Majesty 2513, *d.* Royal Beauty 2433 *by* Lord Derby 2nd 417.

157 **R. N. & H. C.**—F. J. BATCHELOR, Hopwood, Alvechurch, for **May Queen.**

Class 25.—*Hackney Colt or Filly Foals, the produce of mares exhibited in Classes* 23 *and* 24.[1] [10 entries, 2 absent.]

171 **I.** (£10.)—H. V. SHERINGHAM, South Creake, Fakenham, for chestnut colt ; *s.* Copper King 7764, *d.* Creake Sylvia 15017 *by* Challenger 3013. [*Exhibited with No.* 154.]

170 **II.** (£6.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for chestnut filly ; *s.* Royal Danegelt 5785, *d.* Mitre 16055 *by* His Majesty 2513. [*Exhibited with No.* 153.]

169 **III.** (£4.)—R. P. EVANS, Woodhatch House, Reigate, for chestnut filly ; *s.* Evanthius 8463, *d.* B. B. Iris 12433 *by* Chocolate Junior 4185. [*Exhibited with No.* 161.]

168 **R. N. & H. C.**—R. A. DE MANCHA, Waterside Stud, Frogmore, St. Albans.

Class 26.—*Hackney Fillies, foaled in* 1903. [7 entries, none absent.]

175 **I.** (£15, & **R. N. for Champion.**[2])—F. W. BUTTLE, Kirkburn Manor, Driffield, for **Boquhan Sunrise** 16469, chestnut, bred by Stephen Mitchell, Boquhan, Kippen, N.B. ; *s.* Rosador 4964, *d.* Bury Sunflower 1950 *by* Rob Roy 1339.

178 **II.** (£10.)—R. P. EVANS, Woodhatch House, Reigate, for **Terrington Ruth** 16988, bay, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington ; *s.* Lord Drewton 2nd 6817, *d.* Cornflower 8784 *by* Corsica 3519.

180 **III.** (£5.)—W. R. LYSAGHT, Castleford, Chepstow, for **Wyelands Mary** 17066, chestnut ; *s.* Polonius 4931, *d.* Lady Kate 9122 *by* Evolution 2058.

179 **R. N. & H. C.**—SIR WALTER GILBEY, BT., for **Dashing Princess.**

Class 27.—*Hackney Fillies, foaled in* 1904. [8 entries, 2 absent.]

183 **I.** (£15.)—C. E. E. COOKE, Bygrave, Baldock, Herts., for **Lilladora** 17509, chestnut ; *s.* Rosador 4964, *d.* Lilian 8173 *by* Lord Derby 2nd 3092.

185 **II.** (£10.)—W. R. LYSAGHT, Castleford, Chepstow, for **Halcyon** 17351, chestnut ; *s.* Garton Duke of Connaught 3009, *d.* Gold Flash 10006 *by* Goldfinder 6th 1791.

184 **III.** (£5.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Bouncing Duchess** 17151, chestnut ; *s.* Bonny Danegelt 6990, *d.* Garton Duchess of Connaught 6700 *by* Connaught 1453.

187 **R. N. & H. C.**—ROBERT TURNER, Stanford-on-Soar, Loughborough, for **Gem's Leaf.**

Class 28.—*Hackney Fillies, foaled in* 1905.[1] [8 entries, 4 absent.]

191 **I.** (£10.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Lively Beeswing,** chestnut ; *s.* Royal Danegelt 5785, *d.* Lady Cadet 8024 *by* Cadet 1251.

190 **II.** (£6.)—MRS. E. FLETCHER, The Grange Hackney Stud, Angram, York, for **Angram Queen,** chestnut ; *s.* Ganymede 2076, *d.* Lady Connaught 11961 *by* Connaught.

193 **III.** (£4.)—W. E. INMAN, Westfield Lodge, Huddersfield, for **Silverdale,** chestnut ; *s.* Grand Review 8175, *d.* Fennay Maid 12625 *by* Garton Duke of Connaught 3009.

195 **R. N. & H. C.**—RALPH RIMMER, 52, Stramongate, Kendal.

Class 29.—*Hackney Geldings, in hand, foaled in* 1902 *or* 1903, *above* 15 *hands* 2 *inches.* [4 entries, 1 absent.]

200 **I.** (£10.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Sir Hector,** chestnut, foaled 1902 ; *s.* Rosador 4964, *d.* Merry Girl 7102 *by* Topper 1350.

199 **II.** (£6.)—SIR LEES KNOWLES, BT., Westwood, Pendlebury, Manchester, for **Salford Racket,** bay, foaled 1902 ; *s.* Dane Canute 5952, *d.* Activity 8617 *by* Agility 2799.

198 **R. N. & H. C.**—COCKAYNE BROTHERS, Sheffield, for **Paddock Performer.**

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[1] Prizes given by the Derby Local Committee.

[2] Gold Medal, value £10, given by the Hackney Horse Society for the best Hackney Mare or Filly in Classes 23, 24, 26, 27, and 28.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 30.—*Hackney Geldings, in hand, foaled in* 1902 *or* 1903, *above* 15 *hands and not exceeding* 15 *hands* 2 *inches.* [5 entries, 1 absent.]

203 **I.** (£10.)—T. C. McKIBBIN, The Heaning, Windermere, for **Leinster Gelding,** chestnut, foaled 1902 ; *s.* Leinster 6085.
205 **II.** (£6.)—W. B. TUBBS, The Paddocks, Mill Hill, N.W., for **Gongelt,** bay, foaled 1902. *s.* Royal Danegelt 5785, *d.* Lady Gonville 5564 *by* Wymondham Gentleman 2781.
204 **III.** (£4.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Reflector** bay, foaled 1902 ; *s.* Rosador 4964, *d.* Miss Emma 10316 *by* Naffertonian 1527.
202 **R. N. & H. C.**—MRS. E. FLETCHER, Angram, York, for **Angram Sirdar.**

Class 31.—*Hackney Geldings, in hand, foaled in* 1902 *or* 1903, *not exceeding* 15 *hands.* [3 entries, none absent.]

207 **I.** (£10.)—T. C. McKIBBIN, The Heaning, Windermere, for **Flourish,** bay, foaled 1902, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington ; *s.* Golden Rule 6380, *d.* Terrington Flowerette 13970 *by* Caxton 2398.
208 **II.** (£6.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Gainsboro',** brown, foaled 1902 ; *s.* Gentleman John 3624, *d.* Picotee 11376 *by* Garton Duke of Connaught 3009.

Ponies.

Class 32.—*Pony Stallions, foaled before or in* 1903, *not exceeding* 14 *hands.* [8 entries, 2 absent.]

215 **I.** (£10.)—C. H. RAVENHILL STOCK, Darwen Bank, Walton-le-Dale, Preston, for **Son o' Horace** 8653, bay, foaled 1902 ; *s.* Sir Horace 5402, *d.* Witch o' Denmark 16356 *by* Sir Gibbie 1612.
216 **II.** (£6.)—ROBERT WHITWORTH, Londesborough Stud, Southwood End, Halifax, for **Jack Spratt** 9287, bay, foaled 1903 ; *s.* His Majesty 2513, *d.* Jenny Wren 2nd 10054 *by* Tom Tit 2nd 5040.
212 **III.** (£4.)—O. T. PRICE, Brockenhurst, Hants, for **Lyndhurst Phosphorus** 8942, bay, foaled 1903, bred by A. S. Day, Berkeley Towers, Crewe ; *s.* Fireboy 7440, *d.* Peggy Sure Four 13014 *by* Dane Royal 5575.
213 **R. N. & H. C.**—T. P. ROBINSON, Stud Farm, Wigginton, York, for **Ingoldsby.**

Class 33.—*Pony Mares, with Foals at foot, above* 13 *hands, and not exceeding* 14 *hands.* [2 entries.]

218 **I.** (£10.)—W. J. TATEM, Shandon, Pen-y-lan, Cardiff, for **Mel-Valley Princess** 12928, black, foaled 1895 [foal *by* Ruby 1342], bred by Walter Dodd, Gayton, King's Lynn ; *s.* Recruit 1884, *d.* Black Bess 6408 *by* Recruit 1884.
217 **II.** (£6.)—O. T. PRICE, Brockenhurst, for **Gold Fleece** 11863, brown, foaled 1897 [foal *by* Pinderfields Horace 7952], bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington ; *s.* Sir Horace 5402, *d.* Golden Polly 8941 *by* Goldfinder 6th 1791.

Class 34.—*Pony Mares, with Foals at foot, not exceeding* 13 *hands.*[1] [2 entries, 1 absent.]

220 **I.** (£10.)—O. T. PRICE, Brockenhurst, for **Berry Hill Smart** 16445, bay, foaled 1899 [foal *by* Fireboy 7440], bred by W. Hollins, Berry Hill, Mansfield ; *s.* Prospector 6516, *d.* Smut 8458 *by* Sir George 778.

Class 35.—*Pony Fillies or Geldings, foaled in* 1903, *not exceeding* 13 *hands* 3 *inches.*[1] [1 entry, 1 absent.]

[No Exhibit.]

Class 36.—*Pony Colts, Geldings, or Fillies, foaled in* 1904, *not exceeding* 13 *hands* 2 *inches.*[1] [8 entries, none absent.]

229 **I.** (£10.)—W. WAINWRIGHT, The Vine, Moorland Road, Burslem, for **Talke Fire King,** bay colt ; *s.* Fireboy 7440, *d.* Berkeley Lily 14137 *by* Berkeley Model 3663.
224 **II.** (£6.)—J. H. DAY, Handsworth Brewery, Birmingham, for **Little Horace,** bay colt, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington ; *s.* Sir Horace 5402, *d.* Tissington Joan Crompton 14810 *by* Johnnie Crompton 6420.
227 **III.** (£4.)—O. T. PRICE, Brockenhurst, for **Adbolton Horace** 9081, bay colt, bred by A. W. Hickling, Adbolton, Nottingham : *s.* Sir Horace 5402, *d.* Adbolton Belle 14882 *by* Grand Cadet 4797.

Shetland Ponies.

Class 37.—*Shetland Pony Stallions, foaled before or in* 1903, *not exceeding* 10½ *hands.* [5 entries, none absent.]

230 **I.** (£10.)—MRS. AMY J. BEALE, Cacketts, Cudham, Kent, for **Touchstone** 284, black, foaled 1899, bred by the Marquis of Londonderry, Bressay, Shetland ; *s.* Thor 83, *d.* Topaz 1116 *by* Oman 33.

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[1] Prizes given by the Hackney Horse Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

232 **II.** (£6.)—GEORGE A. MILLER, Lawmuir, Methven, Perthshire, for **Steinar** 283, black, foaled 1898, bred by H. F. Anderton, Vaila, Shetland; *s.* Duncan 147, *d.* Dinah 525 *by* Lord of the Isles 26.

233 **III.** (£4.)—THE REV. R. S. MITCHISON, Barby Rectory, Rugby, for **Tommy of Kirkton,** black, foaled 1898, bred by John Cran, Kirkton, Bunchrew, N.B.; *s.* Harold 117, *d.* Roma *by* Young Viscount 48.

231 **R. N. & H. C.**—R. W. R. MACKENZIE, Earlshall, Leuchars, N.B., for **Bellman.**

Class 38.—*Shetland Pony Mares, foaled before or in* 1902, *not exceeding* 10½ *hands.* [4 entries.]

235 **I.** (£10, & **Champion.**[1])—MRS. AMY J. BEALE, Cacketts, Cudham, for **Temerity** 1459, black, foaled 1896, bred by the Marquis of Londonderry, Bressay, Shetland; *s.* Thor 83, *d.* Topaz 1116 *by* Oman 33.

236 **II.** (£6, & **R. N. for Champion.**[1])—R. W. R. MACKENZIE, Earlshall, Leuchars, for **Gold Flower** 236, brown, foaled 1900, bred by John Cran, Kirkton, Inverness; *s.* Harold 117, *d.* Gold Mine *by* Multum in Parvo 28.

237 **III.** (£4.)—GEORGE A. MILLER, Lawmuir, Methven, for **Barbara,** black, foaled 1902, bred by The Ladies Hope, Underriver, Sevenoaks; *s.* Odin 32, *d.* Bretta 811 *by* Odin 32.

238 **R. N. & H. C.**—JOHN G. MURRAY, Benfieldside House, Shotley Bridge, for **Frivolity.**

Mountain and Moorland Ponies.

Class 39.—*Mountain and Moorland Pony Stallions, foaled before or in* 1902, *not exceeding* 13 *hands.* [3 entries.]

241 **I.** (£10.)—THE DUCHESS OF NEWCASTLE, Clumber, Worksop, for **Linnel Don,** dark bay, foaled 1899, bred by R. B. Charlton, Linnel Pony Stud Farm, Hexham; *s.* Little Wonder 2nd 1610, *d.* Pride 1087.

239 **II.** (£6.)—SIR WALTER GILBEY, BT., Elsenham Hall, Essex, for **Shooting Star** 73, dark iron grey, foaled 1901, bred by S. M. Wilmot, The Chalet, Alveston, R.S.O.; *s.* Dyoll Starlight 4, *d.* Alveston Belle 572 *by* Cymro.

240 **III.** (£4.)—E. JONES, Manoravon, Llandilo, for **Greylight** 80, grey, foaled 1901; *s.* Champion Starlight 167, *d.* Myfanwy 356.

Class 40.—*Mountain and Moorland Pony Mares, foaled before or in* 1902, *not exceeding* 13 *hands.* [2 entries.]

243 **I.** (£10.)—J. MARSHALL DUGDALE, Llwyn, Llanfyllin, S.O., for **Llwyn Snowdrop** 1308, grey, foaled 1894, bred by F. Hayes, 88 Rock Lane, Rockferry; *s.* Winnal George.

242 **II.** (£6.)—J. MARSHALL DUGDALE, for **Llwyn Nell** 998, chestnut, foaled 1890, bred by R. Richards, Green Hall, Llanfyllin; *s.* Eiddwen Flyer, *d.* Tibbie.

Riding and Driving Classes.

Class 41.—*Hunter Mares or Geldings, foaled in* 1902.[2] [9 entries, 4 absent.]

252 **I.** (£15.)—F. B. WILKINSON, Cavendish Lodge, Edwinstowe, Newark, for **Splasher,** chestnut gelding, bred by R. Lancaster, Dishforth, Thirsk; *s.* Burnock Water, *d. by* Bradgate,

244 **II.** (£10, & **Champion.**[3])—SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for **Surprise** 3014, bay mare, bred by Lieut.-Col. Z. Walker, Fox Hollies Hall, Acocks Green; *s.* Silver King 54, *d.* My Treasure 2961 *by* Hidden Treasure.

248 **III.** (£5.)—J. H. STOKES, Nether House, Great Bowden, Market Harborough, for **Dervische,** chestnut gelding, bred by Mr. Sanders, Cullyhill, Longtown; *s.* Dan Dancer, *d. by* Goldern Horn.

250 **R. N. & H. C.**—T. & H. WARD, Pinchinthorpe, Great Ayton, for **Wigton.**

Class 42.—*Hunter Mares or Geldings, Novices, foaled in or before* 1901, *up to from* 12 *stone to* 14 *stone.*[2] [10 entries, 2 absent.]

255 **I.** (£15.)—JOHN DRAGE, Chapel Brampton, Northampton, for **Nugget,** brown gelding, foaled 1901, breeder unknown.

259 **II.** (£10.)—J. H. STOKES, Great Bowden, Market Harborough, for **Bullet,** dark bay gelding foaled 1900, breeder unknown.

260 **III.** (£5.)—J. H. STOKES, for **Gold Dust,** chestnut gelding, foaled 1900, breeder unknown.

261 **R. N. & H. C.**—J. H. STOKES, for **Northern Light.**

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[1] Silver Medal given by the Shetland Pony Stud Book Society for the best Shetland Pony in Classes 37 and 38.

[2] Prizes given by the Derby Local Committee.

[3] Gold Medal, value £10 10*s.*, given by the Hunters' Improvement Society for the best Hunter Mare, four years and upwards, registered or entered in the Hunter Stud Book.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 43.—*Hunter Mares or Geldings, Novices, foaled in or before* 1901, *up to more than* 14 *stone.*[1] [5 entries, none absent.]

264 **I.** (£15.)—JOHN DRAGE, Chapel Brampton, Northampton, for **Curate,** brown gelding foaled 1901, breeder unknown.
266 **II.** (£10.)—J. H. STOKES, Great Bowden, Market Harborough, for **Patrician,** chestnut gelding, foaled 1900, bred by Michael Ryan, Park House, Thurles ; *s.* Popoff, *d. by* Tom King.
267 **III.** (£5.)—J. H. STOKES, for **Wrangler,** bay gelding, foaled 1900, breeder unknown.
265 **R. N. & H. C.**—J. H. STOKES, for **Clansman.**

Class 44.—*Hunter Mares or Geldings, foaled in or before* 1902, *up to from* 12 *stone to* 13 *stone* 7 *lb.*[1] [12 entries, 5 absent.]

244 **I.** (£20.)—SIR MERRIK R. BURRELL, BT., Knepp Castle, Horsham, for **Surprise** 3014, bay mare, foaled 1902, bred by Lieut.-Col. Z. Walker, Fox Hollies Hall, Acocks Green : *s.* Silver King 54, *d.* My Treasure 2961 *by* Hidden Treasure.
271 **II.** (£10.)—JOHN DRAGE, Chapel Brampton, Northampton, for **Kildare,** chestnut gelding, foaled 1901, breeder unknown.
270 **III.** (£5.)—A. J. BROWN, The Grove, York Road, Doncaster, for **Riby,** bay gelding, foaled 1900, bred by W. Wood, Habrough, Lincs. ; *s.* Ancle Biter, *d. by* Whitehall.
259 **R. N. & H. C.**—J. H. STOKES, for **Bullet.**

Class 45.—*Hunter Mares or Geldings, foaled in or before* 1902, *up to more than from* 13 *stone* 7 *lb. and not over* 15 *stone.*[1] [10 entries, 2 absent.]

277 **I.** (£20.)—J. H. STOKES, Great Bowden, Market Harborough, for **Whiskey,** bay gelding foaled 1899, breeder unknown.
275 **II.** (£10.)—JOHN DRAGE, Chapel Brampton, Northampton for **Henry,** bay gelding, foaled 1901, breeder unknown.
261 **III.** (£5.)—J. H. STOKES, for **Northern Light,** bay gelding, foaled 1900, breeder unknown.
274 **R. N. & H. C.**—ARTHUR CORY-WRIGHT, Oak Lodge, Totteridge, for **King Edward.**

Class 46.—*Hunter Mares or Geldings, foaled in or before* 1902, *up to more than* 15 *stone.*[1] [6 entries, none absent.]

280 **I.** (£20.)—J. H. STOKES, Great Bowden, Market Harborough, for **Madrid,** chestnut gelding, foaled 1901, bred by J. Begley, Jordanstown, Buttevant, Ireland ; *s.* Matador, *d. by* Lord Cunningham.
264 **II.** £10.)—JOHN DRAGE, Chapel Brampton, Northampton, for **Curate,** brown gelding, foaled 1901, breeder unknown.
266 **III.** (£5.)—J. H. STOKES, for **Patrician,** chestnut gelding, foaled 1900, bred by Michael Ryan, Park House, Thurles ; *s.* Popoff, *d. by* Tom King.
265 **R. N. & H. C.**—J. H. Stokes, for **Clansman.**

Polo and Riding Ponies.

Class 47.—*Polo and Riding Pony Mares or Geldings, foaled in* 1902, *likely to make Polo Ponies, not exceeding* 14 *hands* 2 *inches, or with registered Hurlingham Certificates.*[2] [5 entries, 2 absent.]

282 **I.** (£10.)—JOHN BARKER, M.P., The Grange, Bishop's Stortford, for **Marquis,** bay gelding ; *s.* Sandiway 121, *d.* Lady Polo 975 *by* Lord Polo.
286 **II.** (£6.)—T. P. ROBINSON, Stud Farm, Wigginton, York, for **Mimic,** bay mare, breeder unknown.
285 **III.** (£4.)—O. T. PRICE, Brockenhurst, for **Duchess,** bay mare, breeder unknown.

Class 48.—*Polo and Riding Pony Mares or Geldings, foaled in or before* 1902, *not exceeding* 14 *hands* 2 *inches, or with registered Hurlingham Certificate.*[1] [3 entries.]

289 **I.** (£10.)—O. T. PRICE, Brockenhurst, Hants, for **Moortown,** grey gelding, foaled 1898, breeder unknown.
288 **II.** (£6.)—J. G. MARTIN, Strathmore, Magdala Road, Nottingham, for **Standard,** black gelding, breeder unknown.
287 **III.** (£4.)—MISS PAULINA BIDDULPH, Wood Villa, Longton, Stoke-on-Trent, for **Pierre,** bay gelding, foaled 1902 ; *s.* Young Fashion, *d.* Kit.

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[1] Prizes given by the Derby Local Committee.
[2] Prizes given by the Polo and Riding Pony Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Harness Horses and Ponies.

Class 49.—*Harness Mares or Geldings, Novices, not exceeding* 14 *hands.*[1] [8 entries, 1 absent.]

297 **I.** (£10.)—T. B. SYKES, Breck House, Poulton-le-Fylde, for **Fylde Forester,** bay gelding, foaled 1901; *s.* Invincible 1806, *d.* Grey Leg 1059 F.S.

294 **II.** (£6.)—HOWARD FRANK, Rusthall, Wimbledon Common, for **Burlington Sir Horace** 8776, dark brown gelding, foaled 1902, bred by Henry Tyson, Burlington House, Barrow-in-Furness; *s.* Sir Horace 5402, *d.* Brown Duchess 11668 *by* Ganymede.

295 **III.** (£4.)—G. E. FRANKLIN, The Field, Derby, for **Little Prudence,** bay mare, foaled 1902, bred by W. H. Hanson, Lindum House, Gainsborough; *s.* Berkley Bantam 7360, *d.* Leyswood Prudence 12049 *by* Berkley Model 3663.

293 **R. N. & H. C.**—JOHN R. FOX, Brooklyn, Morton, Gainsborough, for **Bang.**

Class 50.—*Harness Mares or Geldings, Novices, over* 14 *hands and not exceeding* 15 *hands.*[1] [9 entries, none absent.]

299 **I.** (£10.)—DR. G. W. DALSTON-EWBANKE, Borrenthwaite, Kirkby Stephen, for **Affection** 17082, roan mare, foaled 1900; *s.* Garton Performer 6368, *d.* Lady Chancellor *by* Lord Chancellor 1506.

305 **II.** (£6.)—T. B. SYKES, Breck House, Poulton-le-Fylde, for **Fylde Zarena** 15818, chestnut mare, foaled 1902; *s.* Polonius 4931, *d.* Pearletta 9400 *by* Cassius 2397.

300 **III.** (£4.)—G. E. FRANKLIN, The Field, Derby, for **King Gobang**, bay gelding, foaled 1903; *s.* His Majesty 2513, *d.* Lady Mabel 2nd *by* Sir Horace 5402.

298 **R. N. & H. C.**—COCKAYNE BROS., Sheffield, for **Paddock Lucy.**

Class 51.—*Harness Mares or Geldings, Novices, over* 15 *hands.*[1] [13 entries, 3 absent.]

311 **I.** (£10.)—T. C. MCKIBBIN, The Heaning, Windermere, for **Langton Gelding,** chestnut gelding, foaled 1901, bred by Moses Beal, Marramatt, Sledmere, Yorks; *s.* Langton 6078, *d.* Marramatt Princess 17550 *by* Dagenham 4214.

205 **II.** (£6.)—W. B. TUBBS, The Paddocks, Mill Hill, N.W., for **Gongelt,** bay gelding, foaled 1902; *s.* Royal Danegelt 5785, *d.* Lady Gonville 5564 *by* Wymondham Gentleman 2781.

305A **III.** (£4.)—MRS. HARTLEY BATT, 20, Westbourne Street, London, for **Prince Edward,** chestnut, foaled 1901, bred by J. W. Connel, Sunk Island, Hull; *s.* Corn-factor 6312, *d.* Samphire 10494 *by* Diviner 3543.

308 **R. N. & H. C.**—W. E. INMAN, Westfield Lodge, Huddersfield, for **Scotch Laddie.**

Class 52.—*Harness Mares or Geldings, of any age, not exceeding* 13 *hands.*[2] [4 entries, 1 absent.]

314 **I.** (£10.)—G. C. WAUD, Ferniehurst, Baildon, Shipley, for **Ferniehurst Fortuna** 16608, bay mare, foaled 1902; *s.* Sir Horace 5402, *d.* Good Luck 5373 *by* Consequence 1456.

295 **II.** (£6.)—G. E. FRANKLIN, The Field, Derby, for **Little Prudence,** bay mare, foaled 1902, bred by W. H. Hanson, Lindum House, Gainsborough; *s.* Berkley Bantam 7360, *d.* Leyswood Prudence 12049 *by* Berkley Model 3663.

291 **III.** (£4.)—WILLIAM FOSTER, Mel-Valley, Moseley, Worcs., for **Mel-Valley Catch of the Season,** chestnut mare, foaled 1901, bred by John Jones & Sons, Dinarth Hall, Colwyn Bay; *s.* Julius Cæsar 2nd 5666, *d.* Jenny No. 1565 F.S.

Class 53.—*Harness Mares or Geldings, of any age, over* 13 *hands and not exceeding* 14 *hands.*[1] [9 entries, 1 absent.]

316 **I.** (£10.)—MISS CLARKE, Brook House, Haywards Heath, for **Highbrook Belle** (late Royal Fair 14705), chestnut mare, foaled 1900, bred by W. Burdett-Coutts, M.P., Brookfield Stud, Highgate; *s.* Royal Danegelt 5785, *d.* Fair Confidence 3749 *by* Confidence 158.

317 **II.** (£6.)—HOWARD FRANK, Rusthall, Wimbledon Common, for **Tissington Kit Cat** 15488, dark brown mare, foaled 1901, bred by Sir Gilbert Greenall, Bt., Walton Hall, Warrington; *s.* Sir Horace 5402, *d.* Lady Kate 4117 *by* Sir George 778.

315 **III.** (£4.)—CHARLES CLARKE, Bothomes Hall, Whaley Bridge, for **Model Queen** 1649, F.S., brown mare, foaled 1895, bred by W. Galbraith, Hills Farm, Market Drayton; *s.* Berkley Model 3663.

318 **R. N. & H. C.**—T. SMITH, Shirley Stud, Hall Green, Birmingham, for **Shirley Dasher.**

Class 54.—*Harness Mares or Geldings, of any age, over* 14 *hands and not exceeding* 15 *hands.*[2] [10 entries, 1 absent.]

324 **I.** (£10, & **Champion.**[3])—J. S. SYKES, Rangers Lodge, Hawkstone Park, Salop, for **Fylde Sabrinetta** 14341, bay mare, foaled 1900, bred by T. B. Sykes, Breck House, Poulton-le-Fylde; *s.* Garton Duke of Connaught 3009, *d.* Lady Gladys 2911 *by* Lord Derby 2nd 417.

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[1] Prizes given by the Hackney Horse Society.
[2] Prizes given by the Derby Local Committee.
[3] Gold Medal, value £5, given by the Hackney Horse Society for the best Mare or Gelding in Classes 49-56, the produce of a registered Hackney Stallion.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

319 **II.** (£6.)—MRS. HARTLEY BATT, 20, Westbourne Street, London, for **Hopwood Spark**, bay gelding, foaled 1901, bred by F. J. Batchelor, Hopwood, Alvechurch; *s.* Sir Horace 5402, *d.* Queenie 6069 *by* Model 2nd 460.

321 **III.** (£4.)—JOHN R. FOX, Brooklyn, Morton, Gainsborough, for **Lady Defiant** 13649, chestnut mare, foaled 1899, bred by T. Lobley, Gainsborough; *s.* Spitfire 6907, *d.* Ada Kirk 6347 *by* Danegelt 174.

208 **R. N. & H. C.**—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Gainsboro'.**

Class 55.—*Harness Mares or Geldings, of any age, over* 15 *hands and not exceeding* 15 *hands* 2 *inches.*[1] [8 entries, 1 absent.]

326 **I.** (£10, & R. N. for Champion.[2])—S. R. TENNANT, Wold House, Driffield, for **Authority** 7690, bay gelding, foaled 1900; *s.* Ganymede 2076, *d.* Family Pride 2726 *by* Lord Derby 2nd 417.

325 **II.** (£6.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Luminator,** bay gelding, foaled 1901; *s.* Rosador 4964, *d.* Miss Emma 10316 *by* Naffertonian 1527.

311 **III.** (£4.)—T. C. MCKIBBIN, The Heaning, Windermere, for **Langton Gelding,** chestnut gelding, foaled 1901, bred by Moses Beal, Marramatt, Sledmere, Yorks.; *s.* Langton 6078, *d.* Marramatt Princess 17550 *by* Dagenham 4214.

Class 56.—*Harness Mares or Geldings, of any age, over* 15 *hands* 2 *inches.*[1] [10 entries, 1 absent.]

329 **I.** (£10.)—GERARD JURGENS, Oss, Holland, for **Radiant,** brown gelding, foaled 1899, bred by W. Scott, Carluke; *s.* Mathias 6473, *d.* Golden Lily 8938 *by* Goldfinder 6th 1791.

328 **II.** (£6.)—W. E. INMAN, Westfield Lodge, Huddersfield, for **Silver Ness** 12294, chestnut mare, foaled 1897, bred by A. E. W. Darby, Little Ness, Shrewsbury; *s.* Canny Man 2882, *d.* Salopia 2nd 8436 *by* Blaize 2nd 2366.

330 **III.** (£4.)—H. LEMARCHANT, Oakley, Bromley Common, for **The Only Way,** chestnut gelding, foaled 1901, bred by Cockayne Bros., Sheffield; *s.* Polonius 4931, *d.* Paddock Bell 7219 *by* Rufus 1343.

305A **R. N. & H. C.**—MRS. HARTLEY BATT, 20 Westbourne St., W., for **Prince Edward.**

Class 57.—*Pairs of Harness Mares or Geldings, not exceeding* 15 *hands* 2 *inches, driven in Double Harness.*[1] [6 entries, none absent.]

333 **I.** (£10.)—MRS. HARTLEY BATT, 20, Westbourne Street, London, for **Hopwood Spark,** bay gelding, foaled 1901, bred by F. J. Batchelor, Hopwood, Alvechurch; *s.* Sir Horace 5402, *d.* Queenie 6069 *by* Model 2nd 460; and **Hopwood Horace,** bay gelding, foaled 1902, bred by F. J. Batchelor; *s.* Sir Horace 5402, *d.* Queenie 6069 *by* Model 2nd.

338 **II.** (£6.)—S. R. TENNANT, Wold House, Driffield, for **Authority** 7690, bay gelding, foaled 1902; *s.* Ganymede 2076, *d.* Family Pride 2726 *by* Lord Derby 2nd 417; and **Astonishment,** bay gelding, foaled 1902; *s.* Edemynag 5989.

337 **III.** (£4.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Luminator,** bay gelding, foaled 1901; *s.* Rosador 4964, *d.* Miss Emma 10316 *by* Naffertonian 1527; and **Pink Blossom** 15360, bay mare, foaled 1901; *s.* Gentleman John 3624, *d.* Picotee 11376 *by* Garton Duke of Connaught 3009.

336 **R. N. & H. C.**—PAUL HOFFMANN, 4 Cardigan Mansions, Richmond Hill, Surrey, for **King of Fashion** and **Prince Dashaway.**

Class 58.—*Pairs of Harness Mares or Geldings, exceeding* 15 *hands* 2 *inches, driven in Double Harness.*[3] [5 entries, none absent.]

340 **I.** (£10.)—GERARD JURGENS, Oss. Holland, for **Radiant,** brown gelding, foaled 1899, bred by W. Scott, Thornholme, Carluke; *s.* Mathias 6473, *d.* Golden Lily 8938 *by* Goldfinder 6th 1791; and **Glenburn Lass** 15109, brown mare, foaled 1901, bred by W. Mathieson, Glenburn, Horsforth; *s.* Langton Masher 6799, *d.* Winnal Maid 11279 *by* Winnal Fireaway 4085.

341 **II.** (£6.)—JOHN KERR, Loudwater, Rickmansworth, for **Advertisement** 14094, bay mare, foaled 1900, bred by R. Whitworth, Market Weighton; *s.* Edemynag 5989, *d.* Wildflower 2509 *by* Wildfire 1224; and **Paddock Wildfire** 8258, bay gelding, foaled 1900, bred by Cockayne Bros., Sheffield; *s.* Paddock Polonius 7208, *d.* Royal Beauty 2433 *by* Lord Derby 2nd 417.

343 **III.** (£4.)—MISS ELLA S. ROSS, Beechfield, Sale, for **Rowton Blackthorn** 5778, black gelding, foaled 1894, bred by J. W. Macfie, Rowton Hall, Chester; *s.* Grand Fashion 2nd 3024, *d.* Blackie 1449 *by* King Cole 2130; and **Rowton Vinca** 5779, black gelding, foaled 1894, bred by J. W. Macfie; *s.* Grand Fashion 2nd 3024, *d.* Lady Verbena 302 F.S.

339 **R. N. & H. C.**—W. E. INMAN, for **Silver Ness** and **Scotch Laddie.**

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[1] Prizes given by the Derby Local Committee.

[2] Gold Medal, value £5, given by the Hackney Horse Society for the best Mare or Gelding in Classes 49-56, the produce of a registered Hackney Stallion.

[3] Prizes given by the Hackney Horse Society.

[Unless otherwise stated each prize animal named below was "bred by exhibitor."]

Class 59.—*Pairs of Harness Mares or Geldings, of any height, to be driven Tandem.*[1] [9 entries, none absent.]

333 **I.** (£10.)—MRS. HARTLEY BATT, 20 Westbourne Street, London, for **Hopwood Spark,** bay gelding, foaled 1901, bred by F. J. Batchelor, Hopwood, Alvechurch; *s.* Sir Horace 5402, *d.* Queenie 6069 *by* Model 2nd 460; and **Hopwood Horace,** bay gelding, foaled 1902, bred by F. J. Batchelor; *s.* Sir Horace 5402, *d.* Queenie 6069 *by* Model 2nd.

343 **II.** (£6.)—MISS ELLA S. ROSS, Beechfield, Sale, for **Rowton Blackthorn** 5778, black gelding, foaled 1894, bred by J. W. Macfie, Rowton Hall, Chester; *s.* Grand Fashion 2nd 3024, *d.* Blackie 1449 *by* King Cole 2130; and **Rowton Vinca** 5779, black gelding, foaled 1894, bred by J. W. Macfie; *s.* Grand Fashion 2nd 3024, *d.* Lady Verbena 302 F.S.

337 **III.** (£4.)—JOHN MAKEAGUE, Golborne Park, Newton-le-Willows, for **Luminator,** bay gelding, foaled 1901; *s.* Rosador 4964, *d.* Miss Emma 10316 *by* Naffertonian 1527; and **Pink Blossom** 15360, bay mare, foaled 1901; *s.* Gentleman John 3624, *d.* Picotee 11376 *by* Garton Duke of Connaught 3009.

341 **R. N. & H. C.**—JOHN KERR, for **Advertisement** and **Paddock Wildfire.**

Shires.[2]

Class 60.—*Shire Stallions, foaled in* 1903. [5 entries, none absent.]

345 **I.** (£15, & **R. N. for Champion.**[3])—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs., for **Holker Menestrel 2nd** 22451, bay; *s.* Birdsall Menestrel 19337, *d.* Royal Rose 26795 *by* Regent 2nd 6316.

349 **II.** (£10.)—J. W. WHITEHURST, Shire Stud Farm, Markeaton, Derby, for **Markeaton Special Brand** 22572, bay, bred by John Hodson, The Lodge, Mickleover; *s.* Brandmark 19401, *d.* Thorney Bloom 34170 *by* Blythwood Conqueror 14997.

347 **III.** (£5.)—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby, for **Dunsmore Regent** 22315, bay, bred by J. E. Thurman, Birkholme House, Grantham; *s.* Dunsmore Jameson 17972, *d.* Monks Mabel 26510 *by* Carlton Banker 9017.

346 **R. N. & H. C.**—SIR P. ALBERT MUNTZ, BT., M.P., for **Dunsmore Franklin.**

Class 61.—*Shire Stallions, foaled in* 1904. [17 entries, 1 absent.]

352 **I.** (£15, & **Champion.**[3])—EARL EGERTON OF TATTON, Tatton Park, Knutsford, for **Tatton Dray King** 23777, bay, bred by W. Whitehead, Forton Hall, Garstang; *s.* Drayman 23rd 19551, *d.* Flower 32120 *by* Everton Benefactor 13066.

353 **II.** (£10.)—FRANK FARNSWORTH, Tooley Park, Hinckley, for **Ratcliffe Forest King** 23622, bay, bred by J. L. Harrison, Pailton Fields, Rugby; *s.* Lockinge Forest King 18867, *d.* Pailton Queen 33362 *by* King Harold 7496.

363 **III.** (£5.)—LEOPOLD SALOMONS, Norbury Park, Dorking, for **Norbury Menestrel** 23543, bay; *s.* Birdsall Menestrel 19337, *d.* Childwick Youno 35375 *by* Childwick Majestic 17254.

351 **R. N. & H. C.**—THE EXORS. OF THE LATE J. H. BRYARS, for **Dunsmore Commander.**

Class 62.—*Shire Stallions, foaled in* 1905. [14 entries, 1 absent.]

375 **I.** (£15.)—F. E. MUNTZ, Umberslade, Hockley Heath, for **King Forest,** brown, bred by H. R. Craig, Billesdon, Leicester; *s.* Lockinge Forest King 18867, *d.* Lockinge Dimple 29261 *by* Lockinge Warrior 15700.

370 **II.** (£10.)—FRANK FARNSWORTH, Tooley Park, Hinckley, for **Ratcliffe Conquering King,** bay; *s.* Lockinge Forest King 18867, *d.* Ratcliffe Sunflower 37000 *by* Ratcliffe Royal Harold 16910.

372 **III.** (£5.)—MAX MICHAELIS, Tandridge Court, Oxted, for **King of Tandridge,** brown; *s.* Lockinge Forest King 18867, *d.* Rokeby Vesta 22375 *by* Vulcan of Worsley 9th 13736.

367 **R. N. & H. C.**—LEWIS DODD, Park House, Rushton, Tarporley, for **Rustic Friar.**

Class 63.—*Shire Mares, with Foals at foot.* [24 entries, none absent.]

397 **I.** (£15, & **R. N. for Champion.**[4])—LORD ROTHSCHILD, Tring Park, Herts, for **Blythwood Guelder Rose** 22998, brown, foaled 1895 [foal *by* Birdsall Menestrel 19337], bred by Sir James Blyth, Bt., Stansted; *s.* Prince Harold 14228, *d.* Tudor Rose 15842 *by* Hitchin Conqueror 4458.

399 **II.** (£10.)—LEOPOLD SALOMONS, Norbury Park, Dorking, for **Childwick Youno** 35375, bay, foaled 1900 [foal *by* Birdsall Menestrel 19337], bred by the late Sir Blundell Maple, Bt., Childwick; *s.* Childwick Majestic 17254, *d.* Juno of Worsley 9th 21993 *by* Vulcan of Worsley 9th 13736.

391 **III.** (£5.)—R. W. HUDSON, Danesfield, Marlow, for **Blythwood Laurel** 44217, brown, foaled 1900 [foal *by* Hendre Hydrometer 18082], bred by Sir James Blyth, Bt., Stansted; *s.* Ercall Wynn 14620, *d.* Laurel 22046 *by* Maxie 13306.

381 **R. N. & H. C.**—JOHN BRADLEY, Halstead Tilton, Leicester, for **Halstead Duchess 3rd.**

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[1] Prizes given by the Derby Local Committee.

[2] The sum of £60 towards these prizes was given by the Shire Horse Society.

[3] Gold Medal, value £10, given by the Shire Horse Society for the best Shire Stallion in Classes 60-62.

[4] Gold Medal, value £10, given by the Shire Horse Society for the Best Shire Mare or Filly in Classes 63 and 66—69.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 64.—*Shire Colt Foals, the produce of Mares entered in Class* 63.[1]
[15 entries, 1 absent.]

410 **I.** (£10.)—EARL EGERTON OF TATTON, Tatton Park, Knutsford, for bay; *s.* Lockinge Colonist 21609, *d.* Tatton Wagtail 22588 *by* Royal William 2nd 12207. [*Exhibited with No.* 387.]

406 **II.** (£6.)—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs., for bay; *s.* Holker Menestrel 2nd 22451, *d.* Saxon Empress 24685 *by* Harold 3703. [*Exhibited with No.* 383.]

411 **III.** (£4.)—FLETCHER & ANDREWS, Horninghold, Uppingham, for bay; *s.* Dunsmore Jameson 17972, *d.* Hitchin Sunbeam 2nd 20100 *by* Nateby Champion 10018. [*Exhibited with No.* 388.]

412 **R. N. & H. C.**—R. W. HUDSON, Danesfield, Marlow, for **Danesfield President.**

Class 65.—*Shire Filly Foals, the produce of Mares entered in Class* 63.[1]
[9 entries, none absent.]

421 **I.** (£10.)—THOMAS GREEN, The Bank, Pool Quay, Welshpool, for bay; *s.* Bank Nil Desperandum 21096, *d.* Childwick Moss Rose 31368 *by* Vulcan 4145. [*Exhibited with No.* 389.]

424 **II.** (£6.)—SIR. P. A. MUNTZ, BT., M.P., Dunsmore, Rugby, for bay; *s.* Dunsmore Jameson 17972, *d.* Dunsmore Combine 28410 *by* Dunsmore Willington Boy 13021. [*Exhibited with No.* 396.]

428 **III.** (£4.)—T. H. TOMLINSON, The Dale Farm, Willington, Derby, for **Grace of Willington,** bay; *s.* Conquering Duke 17890, *d.* Willington Duchess *by* Sopwell Duke 14302. [*Exhibited with No.* 403.]

423 **R. N. & H. C.**—R. W. HUDSON, Danesfield, Marlow, for bay.

Class 66.—*Shire Mares, without Foals at foot, foaled in or before* 1902.[1]
[10 entries, none absent.]

430 **I.** (£10.)—EARL BEAUCHAMP, K.C.M.G., Madresfield Court, Malvern, for **Sussex Bluegown** 40352, grey, foaled 1900, bred by Thomas Luckin, Thakeham Place, Pulborough; *s.* Nailstone Cœur-de-Lion 16269, *d.* Sussex Blue Bell 22556 *by* Victorious 14397.

435 **II.** (£6.)—SIR BERKELEY D. G. SHEFFIELD, BT., Normanby Park, Doncaster, for **Yatesbury Flower** 37819, bay, foaled 1900, bred by George Cowing, Yatesbury, Calne; *s.* Lockinge Manners 16780, *d.* Kingston Belle 18415 *by* Lincolnshire Boy 3188.

438 **III.** (£4.)—THE DUKE OF SUTHERLAND, K.G., Lilleshall, Newport, Salop, for **Lilleshall Moss Rose** 42512, bay, foaled 1901; *s.* Markeaton Royal Harold 15225, *d.* Fancy 25962 *by* Scalford Hero 14857.

434 **R. N. & H. C.**—SIR P. A. MUNTZ, BT., M.P., Dunsmore, Rugby, for **Bonny Blue.**

Class 67.—*Shire Fillies, foaled in* 1903. [9 entries, 1 absent.]

445 **I.** (£15, & **Champion.**[2])—SIR P. A. MUNTZ, BT., M.P., Dunsmore, Rugby, for **Dunsmore Fuchsia** 44795, grey, bred by G. G. Atterbury, West Haddon, Rugby; *s.* Dunsmore Jameson 17972, *d.* D'Arcy Fuchsia 23455 *by* Dunsmore Wellington Boy 13021.

443 **II.** (£10.)—MAX MICHAELIS, Tandridge Court, Oxted, for **Pailton Sorais** 45919, brown, bred by J. L. Harrison, Pailton Fields, Rugby; *s.* Lockinge Forest King 18867, *d.* Pailton Queen 33362 *by* King Harold 7496.

439 **III.** (£5.)—H.M. THE KING, Sandringham, for **Facsonia** 44927, brown: *s.* Calwich Blend 17226, *d.* Saxon Queen 26829 *by* Prince William 3956.

440 **R. N. & H. C.**—F. S. W. CORNWALLIS, Linton Park, Maidstone, for **Linton Amiable.**

Class 68.—*Shire Fillies, foaled in* 1904. [17 entries, 3 absent.]

463 **I.** (£15.)—ROBERT WHITEHEAD, The Peak Stud, Hargate Hall, Buxton, for **Peak Dolly** 48992, bay; *s.* Dunsmore Jameson 17972, *d.* Girton Dolly Varden 36006 *by* Mormaer of Batsford 15242.

451 **II.** (£10.)—EARL EGERTON OF TATTON, Tatton Park, Knutsford, for **Tatton May Queen** 49580, bay, bred by Joseph Blunt, Filla Farm, Barlestone, Nuneaton; *s.* Lockinge Forest King 18867, *d.* May Blossom 36574 *by* Bury Pilot 8943.

457 **III.** (£5.)—SIR P. A. MUNTZ, BT., M.P., Dunsmore, Rugby, for **Aldeby Lady Jameson** 46847, bay, bred by T. J. Cresswell, Fritton End, Long Stratton; *s.* Dunsmore Jameson 17972, *d.* Lady Ingham 32788 *by* Boscobel 15002.

464 **R. N. & H. C.**—J. W. WHITEHURST, Markeaton, Derby, for **Markeaton Guiding Star.**

Class 69.—*Shire Fillies, foaled in* 1905.[1] [22 entries, 3 absent.]

479 **I.** (£15.)—EGERTON ORME, Ash, Etwall, Derby, for **Combermere Abbess,** brown, bred by Noel Forwood, Burleydam, Whitchurch, Salop; *s.* Tatton Fryer 21953, *d.* Moors Star 26536 *by* Regent 2nd 6316.

465 **II.** (£10.)—H.M. THE KING, Sandringham, for **Buscot Vain Maid,** brown, bred by Sir A. Henderson, Bt., Buscot Park, Faringdon; *s.* Buscot Forester 18599, *d.* Royal Heiress 46147 *by* Markeaton Royal Harold 15225.

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[1] Prizes given by the Derby Local Committee.

[2] Gold Medal, value £10, given by the Shire Horse Society for the best Shire Mare or Filly in Classes 63 and 66—69.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

469 **III.** (£5.)—W. T. EVERARD, Bardon Hall, Leicestershire, for **Ashleigh Royal Duchess,** bay, bred by Gamble Bros., Ashleigh Farm, Braunston ; *s.* Lockinge Forest King 18867, *d.* Ashleigh Duchess 27393 *by* Castern Harold 12898.

480 **R. N. & H. C.**—LORD ROTHSCHILD, Tring Park, Herts, for **Misty Morn.**

Clydesdales.

Class 70.—*Clydesdale Stallions, foaled in* 1903. [5 entries, none absent.]

491 **I.** (£10.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Gamecock** 12583, black ; *s.* Airies Prince 10667, *d.* Bonnie Jean 3rd 13508 *by* Prince of Fashion, vol. 12, p. 361.

487 **II.** (£6.)—MAJOR SPENCER F. CHICHESTER, Embley Park, Romsey, Hants, for **Rich and Rare** 13152, dark bay, bred by John Pollock, Langside, Glasgow ; *s.* Hiawatha 10067, *d.* Lady Sibley 15748 *by* Sir Everard 5353.

Class 71.—*Clydesdale Stallions, foaled in* 1904. [6 entries, 1 absent.]

493 **I.** (£10, & Champion.[1])—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for **Blyth Thomas** 12868, black, bred by A. W. Law, Mains of Sanquhar, Forres ; *s.* Prince Thomas 10262, *d.* Utopia 15121 *by* Ethiopia 5750.

497 **II.** (£6.)—JOHN TOWNSON, Hilton Moor Farm, Bishop Auckland, for **Baron Thomas,** black, bred by the Bishop Auckland Co-operative Society, Staindrop Field House, West Auckland ; *s.* 1st Life Guard 10061, *d.* Picture *by* Sir Thomas 9681.

Class 72.—*Clydesdale Stallions, foaled in* 1905. [7 entries, none absent.]

498 **I.** (£10, & R. N. for Champion.[1])—JAMES KILPATRICK, Craigie Mains, Kilmarnock, for **Rienzi,** brown, bred by Thomas Howie, Fairfield Mains, Monkton ; *s.* Hiawatha 10067, *d.* Pansy of Fairfield 16755 *by* Sir Hugo 10924.

502 **II.** (£6.)—JOHN T. PEACOCK, Low Newport Stud Farm, Silksworth, Sunderland, for **King Harry,** black ; *s.* Silver Cup 11184, *d.* Queen Mary 14360 *by* Scottish Crown.

504 **III.** (£4.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for grey ; *s.* Silver Cup 11184, *d.* Pearldrop 13131 *by* Duddingston 7658.

499 **R. N. & H. C.**—A. B. MATTHEWS, Newton Stewart, for bay.

Class 73.—*Clydesdale Mares, with Foals at foot.* [3 entries.]

507 **I.** (£10, & Champion.[2])—W. M. WOOD, Drawdykes Castle, Carlisle, for **Cedric Princess** 15274, brown, foaled 1898 [foal *by* Baron Hedderwick 11604], bred by the late Thomas Smith, Blacon Point, Chester ; *s.* Baron's Pride 9122, *d.* Fickle Fortune Princess 2nd 12879 *by* Cedric 1087.

506 **II.** (£6.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Rusk,** bay, foaled 1901 [foal *by* Silversmith 12360] ; *s.* Sir Hugo 10924, *d.* Rhona 15257 *by* Lord Stewart 10084.

505 **III.** (£4.)—GEORGE GUNTER, Wetherby Grange, Wetherby, for **Primrose of Glamis,** bay, foaled 1900 [foal *by* Marcellus 11110], bred by Lord Strathmore, Glamis ; *s.* Benedict 10315, *d.* Princess of Glamis 12342 *by* Welbeck 7384.

Class 74.—*Clydesdale Fillies, foaled in* 1903. [2 entries, none absent.]

509 **I.** (£10, & R. N. for Champion.[2])—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Silver Princess,** bay ; *s.* Silver Cup 11184, *d.* Princess Victoria 15779 *by* Moncreiffe Marquis 9953.

Class 75.—*Clydesdale Fillies, foaled in* 1904. [5 entries, none absent.]

513 **I.** (£10.)—SIR JOHN STIRLING MAXWELL, BT., Pollok House, Pollokshaws, Glasgow, for **Wenonah,** light bay, bred by Thomas Crawford, Ardneil, West Kilbride ; *s.* Hiawatha 10067, *d.* Pride of Ardneil 16009 *by* Prince Sturdy 10112.

512 **II.** (£6.)—A. B. MATTHEWS, Newton Stewart, for bay, bred by John Allan, Meadowend, Clackmannan ; *s.* Labori 10791, *d.* Jenny of Meadowend 16466 *by* Baron's Pride 9122.

514 **III.** (£4.)—THE SEAHAM HARBOUR STUD, LTD., The Dene, Seaham Harbour, for **Silver Fern,** brown ; *s.* Silver Cup 11184, *d.* Flirt 11863 *by* The Regent 5408.

511 **R. N. & H. C.**—GEORGE HODGSON, Heads Nook, for **Queen of Quality.**

Suffolks.

Class 76.—*Suffolk Stallions, foaled in* 1903. [6 entries, none absent.]

516 **I.** (£10, & Champion.[3])—KENNETH M. CLARK, Sudbourne Hall, Orford, for **Sudbourne Conqueror** 3232, bred by the Rev. H. Taylor, The Hall, Lavenham ; *s.* Byford's Court Fop 2803, *d.* Stately 2nd 4335 *by* Prince F. 2307.

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[1] Champion Prize of £10 given by the Clydesdale Horse Society for the best Clydesdale Stallion in Classes 70–72.

[2] Champion Prize of £10 given by the Clydesdale Horse Society for the best Clydesdale Mare or Filly in Classes 73-75.

[3] Challenge Cup, value Fifty Guineas, given by the Suffolk Horse Society for the best Suffolk Stallion in Classes 76-78, the Cup to become the absolute property of an Exhibitor winning it three times.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

518 **II.** (£6.)—MAJOR ARNOLD C. QUILTER, Bentley, Ipswich, for **Bentley Cornet** 3122, bred by H. S. R. Stanford, Halesworth ; *s.* Hewitt's Mars 2434, *d.* Bentley Girl 4313 *by* Wedgewood 1749.

519 **III.** (£4.)—A. J. SMITH, Rendlesham, Woodbridge, for **Redwald** 3346, bred by A. Gerald Smith, Great Bealings, Woodbridge; *s.* Wedgewood 1749, *d.* Plenty 2502 *by* Dandy 1617.

515 **R. N. & H. C.**—C. H. BERNERS, Woolverstone Park, Ipswich, for **Prince Edward.**

Class 77.—*Suffolk Stallions, foaled in* 1904. [9 entries, none absent.]

521 **I.** (£10, & R. N. for Champion.[1])—KENNETH M. CLARK, Sudbourne Hall, Orford, for **Sudbourne Arabi** 3287, bred by A. H. E. Wood, late of Sudbourne Hall ; *s.* Sudbourne Count 3257, *d.* Sudbourne Arabelle 5472 *by* Wedgewood 1749.

524 **II.** (£6.)—ARTHUR T. PRATT, Sproughton Hall, Ipswich, for **Sproughton Sunlight** 3134, bred by C. H. Berners, Woolverstone Park, Ipswich ; *s.* Johnstone Sunshine 2734, *d.* Blink Bonny 2nd 3814 *by* Everitt's Warrior 1938.

525 **III.** (£4.)—MAJOR ARNOLD C. QUILTER, Bentley, Ipswich, for **Bentley Clown** 3208, bred by George Rope, Blaxhall, Tunstall ; *s.* Prince Albert 2525, *d.* Blaxhall Dolly Varden 2992 *by* Verger 1550.

528 **R. N. & H. C.**—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Captain Gray.**

Class 78.—*Suffolk Stallions, foaled in* 1905. [2 entries.]

531 **I.** (£10.)—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Major Gray** 3278, bred by W. Gray, Parkham Hall, Wickham Market ; *s.* Saturn 2653, *d.* Daisy 4398 *by* Sutton Swell 2686.

530 **II.** (£6.)—KENNETH M. CLARK, Sudbourne Hall, Orford, for **Sudbourne Arab** 3309 ; *s.* Sudbourne Count 3257, *d.* Sudbourne Arabelle 5472 *by* Wedgewood 1749.

Class 79.—*Suffolk Mares, with Foals at foot.* [5 entries, none absent.]

536 **I.** (£10.)—R. EATON WHITE, Boulge Hall, Woodbridge, for **Boulge Maid** 4840, foaled 1900 [foal *by* Saturn 2653], bred by the late R. Holmes White ; *s.* Prince Wedgewood 2364, *d.* Madge 4276 *by* Berner's Windsor Chieftain 2025.

533 **II.** (£6.)—SIR CUTHBERT QUILTER, BT., Bawdsey Manor, Woodbridge, for **Ramsholt Princess** 4949, foaled 1901 [foal *by* Napolian 2933] ; *s.* Prince Wedgewood 2364, *d.* Ramsholt Beauty 3590 *by* Queen's Diadem 1721.

535 **III.** (£4.)—R. EATON WHITE, for **Boulge Hebe** 4818, foaled 1900 [foal *by* Boulge Monarch 3054] ; *s.* Golden Grain 2479, *d.* Nectar 4177 *by* Wolton's Emperor 1611.

Class 80.—*Suffolk Fillies, foaled in* 1903. [3 entries.]

538 **I.** (£10.)—SIR CUTHBERT QUILTER, BT., Bawdsey Manor, Woodbridge, for **Bawdsey China Aster** 5224 ; *s.* Prince Wedgewood 2364, *d.* Marguerite 3733 *by* Eclipse 2627.

537 **II.** (£6.)—KENNETH M. CLARK, Sudbourne Hall, Orford, for **Sudbourne Beauty** 5511, bred by A. H. E. Wood, late of Sudbourne Hall ; *s.* Prince Albert 2525, *d.* Sudbourne Council 5438 *by* Carthusian 2275.

539 **III.** (£4.)—SIR CUTHBERT QUILTER, BT., for **Bawdsey Proud Lady** 5655, bred by J. I. Smith, Alderton, Woodbridge ; *s.* His Grace 2737, *d.* Primrose Darby 4659 *by* Wedgewood 1749.

Class 81.—*Suffolk Fillies, foaled in* 1904. [4 entries, none absent.]

540 **I.** (£10.)—KENNETH M. CLARK, Sudbourne Hall, Orford, for **Sudbourne Surprise** 5527, bred by Arthur T. Pratt, Sproughton Hall, Ipswich ; *s.* Saturn 2653, *d.* Winnipeg 3494 *by* Czar 1754.

543 **II.** (£6.)—SIR CUTHBERT QUILTER, BT., Bawdsey Manor, Woodbridge, for **Bawdsey Josephine** 5426 ; *s.* Napolian 2933, *d.* The Lady 3297 *by* Warrior 1938.

Agricultural Horses.

Class 82.—*Agricultural Geldings, foaled in* 1902.[2] [6 entries, none absent.]

548 **I.** (£10.)—R. RATCLIFF, Newton Park, Burton-on-Trent, for **Captain,** brown, bred by W. B. Clark, Green Hills, Ainderby Steeple, Northallerton.

547 **II.** (£6.)—PETER DAVIES, Midlands Farm, Warburton, for **Midlands Swell,** bay.

544 **III.** (£4.)—EARL BEAUCHAMP, K.C.M.G., Madresfield Court, Malvern, for **Madresfield Good Hope,** grey ; *s.* Madresfield Thumper 17463, *d.* Madresfield Edith Lass 36522 *by* Ruddington Harold 15813.

545 **R. N. & H. C.**—COOK BROTHERS, Hall Close, Kedleston, Derby.

Class 83.—*Agricultural Geldings, foaled in* 1903.[2] [7 entries, none absent.]

551 **I.** (£10.)—EDWARD DAVIES, The Walk, Partington, Manchester, for **Partington Fashion,** chestnut, bred by A. H. Clark, Moulton Eaugate, Spalding.

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[1] Challenge Cup, value Fifty Guineas, given by the Suffolk Horse Society for the best Suffolk Stallion in Classes 76-78, the Cup to become the absolute property of an Exhibitor winning it three times.

[2] Prizes given by the Derby Local Committee.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

555 II. (£6.)—JOSEPH THEAKSTON, Little Ouseburn, York, for **Fashion**, chestnut; *s.* Hendre Hercules 17386, *d.* Mettle 33121, *by* Nyn Hitchin Duke 14782.
550 III. (£4.)—PETER COATS, Sheepcote, Clifford, Herefordshire, for **Clifford Smiler**, brown; *s.* Hendre Baronet 16714, *d.* Clifford Bright 35409 *by* Leake Prior 3rd 13243.
556 R. N. & H. C.—BERNARD WALL, Hazlewood, Coleshill, for **Hazlewood Bounce**.

Class 84.—*Agricultural Geldings, foaled in* 1904[1]. [2 entries.]

557 I. (£10.)—A. H. CLARK, Moulton Eaugate, Spalding, for **Captain**, roan, bred by Capt. Duncombe, Waresly Park, Sandy; *s.* Castle Bromwich Keith 17865, *d.* Packington Brave Girl 13117 *by* Measham Chief 6124.
558 II. (£6.)—EDWARD DAVIES, The Walk, Partington, Manchester, for **Partington Thumper**, brown, bred by R. Hesketh, Treales, Kirkham; *s.* Horbling Harold.

Asses.

Class 85.—*Donkey Stallions, foaled in or before* 1904, 13 *hands and upwards.*[2] [3 entries.]

559 I. (£5.)—HAROLD SESSIONS, Ifton Manor, Newport, Mon., for **Don Alfonso**, black, foaled 1903.
561 II. (£3.)—A. H. WINGFIELD, Ampthill House, Beds., for **Arrogante**, grey, foaled 1901.
560 R. N. & H. C.—HAROLD SESSIONS, for **Mountain Chief**.

Class 86.—*Donkey Mares (with or without foals)*, 12 *hands and upwards.*[2] [2 entries.]

562 I. (£5.)—HAROLD SESSIONS, Ifton Manor, Newport, for **Juanita**, black, foaled 1897.
563 II. (£2.)—HAROLD SESSIONS, for **Lady Ena**, black, foaled 1901.

CATTLE.

Shorthorns.

Class 87.—*Shorthorn Bulls, calved in* 1902 *or* 1903. [27 entries, 6 absent.]

582 I. (£10, & R. N. for Champion.[3])—F. MILLER, La Belen, Clifton Road, Birkenhead, for **Linksfield Champion** 86401, roan, born May 16, 1903, bred by Col. C. J. Johnston, Linksfield, Elgin: *s.* Scottish Prince 82270, *d.* Kathleen *by* John Peel 67237.
570 II. (£6.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield, for **Meteor** 86631, white, born March 29, 1903, bred by C. Morgan-Richardson, Morgenau, Rhos Hill, R.S.O.: *s.* Moonlight 75110, *d.* Calluna *by* Major 59419.
564 III. (£4.)—H.M. THE KING, Sandringham, for **Royal Carlisle** 84584, roan, born June 16, 1902; *s.* Carlyle 65226, *d.* Cecily Waterloo *by* Scottish Duke 69555.
584 R. N. & H. C.—R. R. ROTHWELL, Miller Arcade, Preston, for **Strowan Marquis 13th**.

Class 88.—*Shorthorn Bulls, calved in* 1904. [63 entries, 12 absent.]

602 I. (£10.)—ALEXANDER T. GORDON, Combscauseway, Insch, N.B., for **Fascinator** 88569, roan, born April 12, bred by James Durno, Jackston, Rothie-Norman; *s.* Lord Lynedoch 74900, *d.* Favourite Blossom *by* Pride of Collynie 75248.
611 II. (£6.)—GEORGE HARRISON, Gainford Hall, Darlington, for **Charming Victor 2nd** 88175, roan, born Feb. 8, bred by E. Ecroyd, Low House, Armathwaite; *s.* Lord Victor 74938, *d.* Charming Countess *by* Duke of Armathwaite 70294.
613 III. (£4.)—GEORGE HARRISON, for **Royal Ensign** 89924, white, born Jan. 16, bred by W. Duthie, Collynie, Tarves, N.B.; *s.* Royal Edward 82153, *d.* Rosetta 6th *by* Waverley 68072.
599 R. N. & H. C.—HENRY DUDDING, Riby Grove, Great Grimsby, for **Prince Alastair**.

Class 89.—*Shorthorn Bulls, calved in* 1905. [81 entries, 14 absent.]

732 I. (£10, & Champion.[3])—J. DEANE WILLIS, Bapton Manor, Codford, Wilts., for **Bapton Viceroy**, red, born Jan. 26; *s.* Violet's Fame 78078, *d.* Vanity (vol. 47, p. 849) *by* Count Lavender 60545.
654 II. (£6.)—H.M. THE KING, Royal Farms, Windsor, for **Royal Windsor**, roan, born March 27; *s.* Luxury 74958, *d.* Remembrance (vol. 51, p. 374) *by* Count Lavender.
696 III. (£4.)—EARL MANVERS, Holme Pierrepont, Nottingham, for **Illustrious Count**, red, born Jan. 26; *s.* Lavender Royal 86380, *d.* Bella Groat *by* Count Nicholas 76435.
680 R. N. & H. C.—JOHN HANDLEY, Green Head, Milnthorpe, for **Frayne Challenger**.

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[1] Prizes given by the Derby Local Committee.
[2] Prizes given by Breeders of Asses.
[3] Champion Prize of £50 given by the Shorthorn Society for the best Shorthorn Bull in Classes 87-89.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 90.—*Shorthorn Cows (in-milk), calved before or in* 1902. [16 entries, 4 absent.]

735 **I. (£10, & R. N. for Champion.**[1])—H.M. THE KING, Royal Farms, Windsor, for **Sylph** (vol. 51, p. 375), red and white, born Feb. 28, 1901, in-milk, calved July 4, 1905; *s.* Royal Duke 75509, *d.* Spruce *by* Volunteer 63501.

749 **II. (£6.)**—ROBERT TAYLOR, Pitlivie, Carnoustie, N.B., for **Donside Princess** (vol. 49, p. 426), roan, born Feb. 27, 1899, in-milk, calved Jan. 23, 1906, bred by A. Campbell, Deystone, Kintore; *s.* Director 72350, *d.* Donside Lady *by* Clan Alpine 60495.

750 **III. (£4.)**—J. DEANE WILLIS, Bapton Manor, Codford, Wilts, for **White Heather** (vol. 47, p. 850), white, born Feb. 1, 1898, in-milk, calved Jan. 16, 1906, bred by J. B. Manson, Kilblean, Oldmeldrum; *s.* Merrymason 67486, *d.* Beauty 24th *by* Morton.

742 **R. N. & H. C.**—GEORGE HARRISON, Gainford Hall, Darlington, for **Ursula Raglan.**

Class 91.—*Shorthorn Heifers (in-milk), calved in* 1903.[2] [14 entries, 2 absent.]

761 **I. (£10.)**—SIR OSWALD MOSLEY, BT., Rolleston Hall, Burton-on-Trent, for **Proud Duchess** (vol. 50, p. 767), red and white, born Feb. 16, in-milk, calved Jan. 21, 1906; *s.* Beauty's Pride 78371, *d.* Rolleston Duchess *by* Lord Lawrence 72889.

764 **II. (£6.)**—ROBERT TAYLOR, Pitlivie, Carnoustie, N.B., for **Silver May** (vol. 51, p. 417), roan, born Jan. 3, in-milk, calved Jan. 22, 1906, bred by Joseph Barnes, Baurgh Syke, Wigton; *s.* Stoneytown Pride 77972, *d.* Golden May *by* Golden Hind 57392.

752 **III. (£4.)**—LORD CALTHORPE, Elvetham Park, Winchfield, for **Ruby 4th** (vol. 50, p. 830), roan, born Feb. 21, in-milk, calved Jan. 6, 1906, bred by W. & J. W. Peterkin, Dunglass, Conon Bridge; *s.* Collynie Conqueror 78609, *d.* Ruby *by* Chieftain 2nd 70152.

758 **R. N. & H. C.**—GEORGE HARRISON, Gainford Hall, Darlington, for **Towy Princess.**

Class 92.—*Shorthorn Heifers, calved in* 1904. [32 entries, 7 absent.]

783 **I. (£10.)**—SIR OSWALD MOSLEY, BT., Rolleston Hall, Burton-on-Trent, for **Rolleston Regina** (vol. 51, p. 789), red and white, born March 1; *s.* Regulator 84488, *d.* Rolleston Duchess *by* Lord Lawrence 72889.

784 **II. (£6.)**—SIR OSWALD MOSLEY, BT., for **Rolleston Spice** (vol. 51, p. 788), roan, born July 22; *s.* Beauty's Pride 78371, *d.* Crewe Spice *by* Cupbearer 68434.

765 **III. (£4.)**—THOMAS ATKINSON, Redvales Farm, Bury, for **Takeley Jinny** (vol. 51, p. 641), roan, born Jan. 8; *s.* Chewton Victor 6th 80686, *d.* Jinny 18th *by* Lord Derwent 3rd 77050.

770 **R. N. & H. C.**—JEREMIAH COLMAN, Gatton Park, Surrey, for **Snow Queen.**

Class 93.—*Shorthorn Heifers, calved in* 1905. [66 entries, 8 absent.]

859 **I. (£10, & Champion.**[1])—J. DEANE WILLIS, Bapton Manor, Codford, Wilts., for **Golden Garland,** roan, born Feb. 17: *s.* Violet's Fame 78078, *d.* Golden Geraldine (vol. 44, p. 726) *by* Count Lavender 60545.

800 **II. (£6.)**—A. F. BASSET, Tehidy, Camborne, for **Tehidy Queen of Brilliants 2nd,** roan, born March 23; *s.* Shamrock 84742, *d.* Brilliant Princess 2nd (vol. 51, p. 424) *by* Bapton Juan 71971.

848 **III. (£4.)**—ROBERT TAYLOR, Pitlivie, Carnoustie, for **Pitlivie Rosebud 2nd,** roan, born April 7; *s.* Golden Dawn 72609, *d.* Rubina *by* Silver Wave 2nd 87368.

821 **R. N. & H. C.**—JAMES HORLICK, Cowley Manor, Cheltenham, for **Bianca Beauty 2nd.**

Class 94.—*Shorthorn Dairy Cows (in-milk), calved before or in* 1901, *entered or eligible for entry in Coates's Herd Book.*[2] [12 entries, 2 absent.]

871 **I. (£10, & R. N. for Champion.**[3])—LORD ROTHSCHILD, Tring Park, Herts., for **Warwickshire Hettie,** roan, born July 15, 1899, in-milk, calved March 23, 1906, bred by J. Cave, Priory Farm, Wolston, Coventry; *s.* Milverton 7th 75094, *d.* Warwickshire Lass 2nd *by* Lord Waterloo Blanche 67403.

869 **II. (£6.)**—LORD ROTHSCHILD, for **Moppy Gem 5th** (vol. 47, p. 746), red and little white, born April 10, 1897, in-milk, calved May 30, 1906, bred by Taylor & Walton, Hall Garth, Kirkby Stephen; *s.* Dunottar 68554, *d.* Moppy Gem 2nd *by* Ingram Swell,

874 **III. (£4.)**—C. E. WODEHOUSE, Woolmers, Hertford, for **Coronet 10th** (vol. 45, p. 782), red and little white, born Feb. 22, 1895, in-milk, calved March 13th, 1906; *s.* Earl of Southrop 96th 63960, *d.* Coronet 5th *by* Earl of Fawsley 16th 55660.

872 **R. N. & H. C.**—GEORGE TAYLOR, Cranford, Hounslow, for **Darling 4th.**

Class 95.—*Shorthorn Dairy Cows (in-milk), calved in* 1902, *entered or eligible for entry in Coates's Herd Book.*[2] [5 entries, 2 absent.]

879 **I. (£10, & Champion.**[3])—G. W. TYSER, Oakfield, Mortimer, for **Lady Lee 21st,** roan, born Jan. 1, in-milk, calved March 9, 1906, bred by F. P. Bulley, Marston Hill, Fairford; *s.* Dowsby Kirklevington Duke 3rd 76515, *d.* Lady Lee 15th *by* Trafalgar 2nd.

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[1] Champion Prize of £50 given by the Shorthorn Society for the best Shorthorn Cow or Heifer in Classes 90-96.

[2] Prizes given by the Shorthorn Society.

[3] Champion Prize of £10 given by the Dairy Shorthorn (Coates's Herd Book) Association for the best animal in Classes 94-96.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

878 **II.** (£6.)—G. W. TYSER, for **Darlington Cran,** roan, born April 12, in-milk, calved April 23, 1906, bred by George Taylor, Cranford, Hounslow ; *s.* Beau Sabreur 74049, *d.* Darlington Cranford 2nd (vol. 47, p. 803) *by* Earl of Blagdon 62477.

875 **III.** (£4.)—C. R. W. ADEANE, Babraham Hall, Cambridge, for **Babraham Darling Lady** (vol. 49, p. 329), red, born Feb. 24, in-milk, calved May 26, 1906 ; *s.* Red Lord 15th 77593, *d.* Darling 6th *by* Blair Athol 60367.

Class 96.—*Shorthorn Dairy Heifers, in-milk, calved in* 1903, *entered or eligible for entry in Coates's Herd Book.*[1] [3 entries.]

880 **I.** (£10.)—JOHN BRITTEN, Little Billing, Northampton, for **Haddon Lassie** (vol. 50, p. 480), red, born Jan. 9, in-milk, calved June 9, 1906, bred by John Cooper, Brook Hill, East Haddon ; *s.* FitzGerald 78879, *d.* Rosedale Lassie 3rd *by* Relative 75411.

882 **II.** (£5.)—LORD ROTHSCHILD, Tring Park, Herts., for **Rotorna,** roan, born March 12, in-milk, calved May 26, 1906, bred by W. B. Ledger, The Isle Park Farm, Shrewsbury ; *s.* Dieudonne 78704, *d.* Roseleaf (vol. 48, p. 625) *by* Count Nottingham 74296.

881 **R. N. & H. C.**—J. T. HOBBS, Maisey Hampton, Fairford, for **Quicksilver 94th.**

Class 97.—*Milk-yield Prizes, open to Shorthorn Cows and Heifers entered in Classes* 90, 91, 94, 95, *and* 96 *only.* [8 entries, none absent.]

863 **I.** (£10.)—C. R. W. ADEANE, Babraham Hall, Cambridge, for **Lady Crystal Bates** (vol. 50, p. 349), roan, born Oct. 3, 1900, in-milk, calved May 29, 1906 ; *s.* Crystal Count 76457, *d.* Lady Eden Bates *by* Duke of Oxford 72nd 51143.

866 **II.** (£5.)—W. A. H. BASS, Byrkley Lodge, Burton-on-Trent, for **Lady Dorothy 50th** (vol. 51, p. 423), red, born May 20, 1901, in-milk, calved May 21, 1906, bred by T. B. Goucher, Newton-on-the-Hill, Salop ; *s.* Collynie Bates 76377, *d.* Lady Dorothy 10th *by* Vulcan 56074.

Lincolnshire Red Short-horns.

N.B.—In the Lincolnshire Red Short-horn Classes, the number inserted within brackets after the name of an animal indicates that the animal is entered in Coates's Herd Book. A number without brackets indicates that the animal is registered in the Lincolnshire Red Short-horn Herd Book.

Class 98.—*Lincolnshire Red Short-horn Bulls, calved in* 1902 *or* 1903. [3 entries.]

883 **I.** (£10.)—ROBERT CHATTERTON, Stenigot, Lincoln, for **Stenigot Regal Chief,** born June 27, 1903, bred by R. & R. Chatterton, Stenigot : *s.* Red Chief 2611, *d.* Stenigot Flower 4th *by* County Member 83.

884 **II.** (£6.)—S. CRAWLEY, Hemington, Oundle, for **Weston Monarch 2nd** 3144, born March 12, 1902, bred by W. J. Atkinson, Weston St. Mary, Spalding ; *s.* Red Monarch (77605), *d.* Weston Charm *by* Pippins Pride (71157).

885 **R. N. & H. C.**—ANSELM PARKER, Walsall, for **Saltfleet Bonus.**

Class 99.—*Lincolnshire Red Short-horn Bulls, calved in* 1904.[2] [7 entries, none absent.]

890 **I.** (£10.)—CHARLES T. GARLAND, Moreton Morrell, Warwick, for **Surfleet Baronet** 4127, born Jan. 1, bred by the late Alfred Smith, Surfleet, Lincs. ; *s.* Surfleet Baron 2666, *d.* Surfleet Erena *by* Lord Fairfax 13th 1925.

887 **II.** (£6.)—ROBERT CHATTERTON, Stenigot, Lincoln, for **Stenigot Royal Chieftain,** born July 5, bred by R. & R. Chatterton, Stenigot ; *s.* Red Chief 2611, *d.* Stenigot Flower 4th (vol. 9, p. 164) *by* County Member 83.

886 **III.** (£4.)—W. J. ATKINSON, Weston St. Mary, Spalding, for **Weston Monarch 4th** 4187, born April 24 ; *s.* Royal Crest (82149), *d.* Weston Charm *by* Pippins Pride (71157).

889 **R. N. & H. C.**—JOHN EVENS, Burton, Lincoln, for **Harpswell Prince.**

Class 100.—*Lincolnshire Red Short-horn Bulls, calved in* 1905.[2] [7 entries, none absent.]

896 **I.** (£10.)—JOHN LANGHAM, The Park, Nottingham, for **Brandon Grenadier,** born Feb. 4 : *s.* Brandon Lord Chief Justice 2425, *d.* Brandon Nonpareil.

893 **II.** (£6.)—THE EXORS. OF THE LATE T. BETT, Benniworth Walk, Donington-on-Bain, Lincoln, for **Benniworth 39th,** born Jan. ; *s.* Saltfleet Echo 3038, *d. by* Theddington 151.

894 **III.** (£4.)—ROBERT CHATTERTON, Stenigot, Lincoln, for **Gosberton Beau,** born Jan. 16, bred by Robert Mowbray, Gosberton, Spalding ; *s.* Clan Macdonald (78597), *d. by* Benniworth 7th 1458.

898 **R. N. & H. C.**—JOHN MEASURES, Dunsby, Bourne, for **Sansthorpe Red 12th.**

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[1] Prizes given by the Dairy Shorthorn (Coates's Herd Book) Association.
[2] Prizes given by the Lincolnshire Red Short-horn Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 101.—*Lincolnshire Red Short-horn Cows (in-milk), calved before or in* 1902. [4 entries, 1 absent.]

902 **I.** (£10.)—JOHN EVENS, Burton, Lincoln, for **Burton Quality 3rd** (vol. 10, p. 189), born Feb. 24, 1901, in-milk, calved June 11, 1906; *s.* Red Rover (77618), *d.* Burton Quality *by* Collingwood (57074).

901 **II.** (£6.)—JOHN EVENS, for **Burton Primrose 2nd,** born April 19, 1899, in-milk, calved April 20, 1906; *s.* Knight of Chewton (68867), *d. by* Gwynne 133.

Class 102.—*Lincolnshire Red Short-horn Heifers (in-milk), calved in* 1903. [2 entries.]

905 **I.** (£10.)—CAPT. E. M. GRANTHAM, The Rookery, West Keal, Spilsby, for **Keal Nancy,** born March 27, in-milk, calved Feb. 3, 1906: *s.* Conbalcom 1831, *d.* Keal Favourite *by* Stenigot Red 580.

904 **R. N. & H. C.**—CHARLES T. GARLAND, Moreton Morrell, Warwick, for **Surfleet Dorothy** (vol. 11, p. 205), born May 12, in-milk, calved Feb. 6, 1906, bred by Leslie W. Stephenson, South Thoresby, Alford, Lincs.; *s.* Scampton Bloodsucker 3043, *d. by* Baron Ormsby 3rd 26.

Class 103.—*Lincolnshire Red Short-horn Heifers, calved in* 1904.[1] [5 entries, none absent.]

910 **I.** (£10.)—JOHN LANGHAM, The Park, Nottingham, for **Brandon Lovely,** born Sept. 11; *s.* Brandon Blend, *d. by* Collinwood 2nd.

908 **II.** (£6.)—CHARLES T. GARLAND, Moreton Morrell, Warwick, for **Strubby Pride,** born June 1, bred by J. W. Farrow & Sons, Strubby, Alford, Lincs.; *s.* Lord Augustine (81472), *d.* Strubby Queen *by* Weighty Tom 2nd 558.

907 **III.** (£4.)—EARL EGERTON OF TATTON, Tatton Park, Knutsford, for **Favourite,** born April 20, bred by the late T. B. Freshney, South Somercotes, Louth; *s.* Saltfleet Bonus 3582, *d. by* Grandad 1561.

906 **R. N. & H. C.**—ROBERT CHATTERTON, Stenigot, Lincoln, for **Stenigot Gwynne 22nd.**

Class 104.—*Lincolnshire Red Short-horn Heifers, calved in* 1905.[1] [4 entries, none absent.]

911 **I.** (£10.)—ROBERT CHATTERTON, Stenigot, Lincoln, for **Stenigot Buttercup 16th,** born Jan. 9, bred by R. & R. Chatterton, Stenigot; *s.* Red Chief 2611, *d.* Stenigot Buttercup 10th *by* Wolseley 1436.

914 **II.** (£6.)—CAPT. E. M. GRANTHAM, The Rookery, West Keal, Spilsby, for **Keal Hilda,** born April 13; *s.* Scampton Excavator 4084, *d.* Keal Daisy *by* Saltfleet John Bull 1339.

912 **R. N. & H. C.**—EARL EGERTON OF TATTON, Tatton Park, Knutsford, for **Beauty.**

Class 105.—*Milk Yield Prizes, open to Lincolnshire Red Short-horn Cows and Heifers entered in Classes* 101 *and* 102 *only.* [4 entries, none absent.]

900 **I.** (£10.)—JOHN EVENS, Burton, Lincoln, for **Burton 4th** (vol. 10, p. 189), born April 23, 1900, in-milk, calved May 15, 1906; *s.* Longfellow 1605, *d.* Burton *by* Professor 200.

901 **II.** (£5.)—JOHN EVENS, for **Burton Primrose 2nd,** born April 19, 1899, in-milk, calved April 20, 1906; *s.* Knight of Chewton (68867), *d. by* Gwynne 133.

Herefords.

Class 106.—*Hereford Bulls, calved in* 1902 *or* 1903. [4 entries, 1 absent.]

915 **I.** (£10.)—H.M. THE KING, Royal Farms, Windsor, for **Admiral** 23256, born Jan. 19, 1903; *s.* Earlsfield 19387, *d.* Angelica *by* Grove Prince 16745.

916 **II.** (£6.)—THE EARL OF COVENTRY, Croome Court, Severn Stoke, Worcs., for **Lama** 23550, born March 20, 1903; *s.* Fortunio 21396, *d.* Ladylove *by* Royal Ruler 13406.

917 **III.** (£4.)—T. R. THOMPSON, Erwr Delyn, Penarth, for **Fairlad** 24024, born Dec. 23, 1903, bred by J. Smith, Monkton, Hereford; *s.* Brigadier 21969, *d.* Blossom *by* Leander.

Class 107.—*Hereford Bulls, calved in* 1904. [6 entries, 2 absent.]

921 **I.** (£10, & **Champion.**[2])—CAPT. E. L. A. HEYGATE, Buckland, Leominster, for **Cameronian** 23934, born Jan. 11; *s.* Cherry Stone 22031, *d.* Cambria *by* Iron King 18884,

920 **II.** (£6.)—SIR J. R. G. COTTERELL, BT., Garnons, Hereford, for **Rameses 2nd** 24238. born Jan. 24; *s* Rameses 23100, *d.* Easter Morn *by* Gold Box 15339.

922 **III.** (£4.)—CAPT. E. L. A. HEYGATE, for **Coronet** 23968, born April 2; *s.* Baronet 20456 *d.* Cherry Ripe *by* Thickset 17574.

Class 108.—*Hereford Bulls, calved in* 1905. [21 entries, 11 absent.]

942 **I.** (£15,[3] & **R. N. for Champion.**[2])—STEPHEN ROBINSON, Lynhales, Kington, for **Major,** born Jan. 23; *s.* Commandant 22040, *d.* Madge (vol. 36, p. 583) *by* Sir Garnet.

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[1] Prizes given by the Lincolnshire Red Short-horn Association.

[2] Champion Prize of £10 10*s* given by the Hereford Herd Book Society for the best Hereford Bull in Classes 106-108.

[3] First Prize given by the Hereford Herd Book Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

941 **II.** (£10.)—CHARLES T. PULLEY, Lower Eaton, Hereford, for **Eaton Wilton,** born Feb. 10; *s.* Glendower 2nd 22169, *d.* Lady Wilton (vol. 34, p. 585) *by* Eaton Defender 12th 20602.

925 **III.** (£6.)—SIR W. ROUSE BOUGHTON, BT., Downton Hall, Ludlow, for **Park Royal,** born Jan. 30, bred by the late Sir C. H. Rouse Boughton Bt., Downton Hall; *s.* G.W.R. 22189, *d.* Lady Betty (vol. 36, p. 170) *by* Royalist 3rd 16958.

939 **IV.** (£4.)—REES KEENE, Llanvihangel Court, Rogiet, Newport, Mon., for **Resister,** born Feb. 2; *s.* Curate 22063, *d.* Fan Tan (vol. 36, p. 430) *by* Rokeby 19694.

938 **R. N. & H. C.**—ALLEN E. HUGHES, Wintercott, Leominster, for **Paragon.**

Class 109.—*Hereford Cows or Heifers (in-milk), calved before or in* 1903. [6 entries, 1 absent.]

951 **I.** (£10, & R. N. for Champion.[1])—ALLEN E. HUGHES, Wintercott, Leominster, for **Irvington Plum** (vol. 35, p. 444), born Jan. 22, 1903, in-milk, calved Jan. 20, 1906; *s.* Malcolm 21575, *d.* Wintercott Plum 2nd *by* Nonpareil 19614.

948 **II.** (£6.)—PETER COATS, Sheepcote, Clifford, for **Pearl 15th** (vol. 36, p. 220), born March 21, 1898, in-milk, calved June 18, 1905, bred by the late J. H. Arkwright, Hampton Court, Leominster; *s.* Montezuma 18486, *d.* Pear 11th *by* Rose Cross 2nd 14865.

950 **III.** (£4.)—J. R. HILL, Orleton Court, R.S.O., for **Western Star** (vol. 35, p. 429), born Feb. 14, 1903, in-milk, calved June 3, 1906; *s.* Macbeth 21566, *d.* Phyllis *by* Renovator.

946 **R. N. & H. C.**—SIR W. ROUSE BOUGHTON, BT., for **Lavender.**

Class 110.—*Hereford Heifers, calved in* 1904. [10 entries, 3 absent.]

959 **I.** (£10, & Champion.[1])—LAWTON MOORE, Brampton Brian, for **Brampton Agnes 33rd,** born April 4; *s.* Bonanza 21962, *d.* Brampton Agnes 6th (vol. 35, p. 507) *by* Brampton Colonel 18724.

961 **II.** (£6.)—T. R. THOMPSON, Erwr Delyn, Penarth, for **Beauty 3rd** (vol. 36, p. 643), born Feb. 5; *s.* King John 20114, *d.* Beauty 2nd *by* Clarence 15944.

956 **III.** (£4.)—PETER COATS, Sheepcote, Clifford, for **Pearl** (vol. 36, p. 219), born Jan. 16; *s.* Endale 21366, *d.* Douglas Pearl *by* Endale Hero 18825.

957 **R. N. & H. C.**—W. H. DAVIES, Claston, Dormington, for **Counter.**

Class 111.—*Hereford Heifers, calved in* 1905. [12 entries, 2 absent.]

970 **I.** (£10.)—JAMES SMITH, Monkton, Hereford, for **Bellona,** born Jan. 28; *s.* Brigadier 21969, *d.* Blossom (vol. 35, p. 661) *by* Leander 16146.

973 **II.** (£6.)—W. B. TUDGE, Stepaside, Onibury, for **Princess Beatrice,** born Jan. 27; *s.* All-fours 22697, *d.* Beatrice 19th (vol. 35, p. 163) *by* Montezuma 18486.

967 **III.** (£4.)—CHARLES T. PULLEY, Lower Eaton, Hereford, for **Daisy 6th,** born Jan. 27; *s.* Eaton Goldbox 22841, *d.* Broady 24th (vol. 36, p. 564) *by* Strafford 14946.

972 **R. N. & H. C.**—D. A. THOMAS, M.P., Llanwern Park, Newport, Mon., for **Little Mary.**

Devons.

Class 112.—*Devon Bulls, calved in* 1902 *or* 1903. [3 entries.]

975 **I.** (£10, & R. N. for Champion.[2])—SAMUEL KIDNER, Bickley, Milverton, for **Bickley Quaker** 4898, born May 23, 1903; *s.* Magna Charta of Pound 4446, *d.* King Cole's Fairy 16899 *by* King Cole 3758.

976 **II.** (£6.)—J. C. WILLIAMS, Caerhays Castle, Gorran, for **Dianthus** 4961, born Feb. 6, 1903; *s.* Dramatist 4015, *d.* Blooming Cow 6th 14281 *by* Whitehall 2175.

974 **R. N. & H. C.**—J. L. HUXTABLE, Bishop's Tawton, Barnstaple, for **Duke of Overton.**

Class 113.—*Devon Bulls, calved in* 1904. [3 entries.]

978 **I.** (£10, & Champion.[2])—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton, for **Pound Pink'un** 5350, born Jan. 4, bred by A. C. Skinner, Bishop's Lydeard; *s.* Councillor 3407 *d.* Pink 17th 19064 *by* Wilscombe 3679.

977 **II.** (£6.)—T. S. MORGAN, Whimple House, Whimple, Exeter, for **Lord Daws 8th,** born Nov. 26, bred by A. J. Hill, Road Water, Washford, Somerset; *s.* Apollo 4700, *d.* Loophorn 5th 13965 *by* Daisy's Dumpling 1933.

979 **R. N. & H. C.**—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Royal 2nd.**

Class 114.—*Devon Bulls, calved in* 1905. [4 entries, 1 absent.]

982 **I.** (£10.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Bellringer** 5617, born May 30; *s.* Councillor 3407, *d.* Belle of Park 13570 *by* Good Boy 2414.

981 **II.** (£6.)—J. L. HUXTABLE, Overton, Bishop's Tawton, Barnstaple, for **Overton Ringleader** 5612, born Feb. 26; *s.* Duke of Overton 4973, *d.* Joyful Maid 16893 *by* Bringgoods Duke 3544.

980 **R. N. & H. C.**—H.M. THE KING, Royal Farms, Windsor, for **Larry.**

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[1] Champion Prize of £10 10*s.* given by the Hereford Herd Book Society for the best Hereford Cow or Heifer in Classes 109-111.

[2] Champion Prize of £10 10*s.* given by the Devon Cattle Breeders' Society for the best Devon Bull in Classes 112-114.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 115.—*Devon Cows or Heifers (in-milk), calved before or in* 1903. [5 entries, 2 absent.]

984 **I.** (£10, & **Champion.**[1])—H.M. THE KING, Royal Farms, Windsor, for **Ruby** 18573, born March 14th, 1902, in-milk, calved May 24, 1906; *s.* Quantock Bridegroom 4097, *d.* Whitstone Lovely 12951 *by* The Vicar 2156.

985 **II.** (£6.)—T. S. MORGAN, Whimple House, Whimple, Exeter, for **Whimple Beauty 2nd** 18965, born April 14, 1902, in-milk, calved May 2, 1906; *s.* Dodington Hero 4177, *d.* Beauty 5th 16669 *by* The Pink'un 2684.

987 **R. N. & H. C.**—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton, for **Telltale**

Class 116.—*Devon Heifers, calved in* 1904. [7 entries, 2 absent.]

992 **I.** (£10, & **R. N. for Champion.**[1])—T. S. MORGAN, Whimple House, Whimple, Exeter for **Whimple Beauty 5th** 20191, born Jan. 4; *s.* Hestercombe Redlight 4417, *d.* Beauty 5th 16669 *by* The Pink'un 2684.

989 **II.** (£6.)—H.M. THE KING, Royal Farms, Windsor, for **Lucy** 19800, born Feb. 10; *s.* Benedictine 4141, *d.* Lovely 5th 13857 *by* Lord Currypool 2nd 2619.

994 **III.** (£4.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Ruby 14th** 20326, born Jan. 17; *s.* Hestercombe May Day 4214, *d.* Pound Ruby 12th 18464 *by* Merryman 4082.

990 **R. N. & H. C.**—H.M. THE KING, for **Nosegay.**

Class 117.—*Devon Heifers, calved in* 1905. [5 entries, 1 absent.]

998 **I.** (£10.)—T. S. MORGAN, Whimple House, Whimple, Exeter, for **Whimple Broad Horn 1st** 20845, born Jan. 4; *s.* Pound Mayor 4850, *d.* Broad Horn 4th 17729 *by* Gay Lad 3589.

999 **II.** (£6.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, for **Pound Ruby 17th** 20977, born April 11; *s.* Lord Nurthey 5060, *d.* Ruby 3rd of Pound 13614 *by* Masterpiece 2837.

996 **R. N. & H. C.**—H.M. THE KING, Royal Farms, Windsor, for **Carolina.**

South Devons.

Class 118.—*South Devon Bulls, calved in* 1902 *or* 1903. [3 entries, none absent.]

1002 **I.** (£10.)—J. SPARROW WROTH, Coombe, Aveton Gifford, for **Macbeth** 1924, born May 10, 1903: *s.* Duke of York 1439, *d.* Netta 3rd 3653 *by* Marmion 631.

1003 **II.** (£6.)—J. SPARROW WROTH, for **Star's Duke** 1764, born Aug. 10, 1902; *s.* Widland Masher 1244, *d.* Star's Marchioness 3659 *by* Marmion 631.

Class 119.—*South Devon Cows or Heifers (in-milk), calved before or in* 1903. [6 entries, 1 absent.]

1005 **I.** (£10.)—BENJAMIN BUTLAND, Leigham, Plympton, for **Handsome** 4040, born March 27, 1900, in-milk, calved March 7, 1906; *s.* Cromer 969, *d.* Beauty 1st 1000 *by* Melton.

1006 **II.** (£6.)—W. P. VOSPER, Merafield, Plympton, for **Laura** 5676, born Feb. 20, 1903, in-milk, calved Nov. 10, 1905; *s.* Drummer 975, *d.* Cowslip 4th 3923 *by* Prince Edward.

1009 **R. N. & H. C.**—J. SPARROW WROTH, Coombe, Aveton Gifford, for **Lorna Doone 2nd.**

Class 120.—*Milk Yield Prizes, open to South Devon Cows and Heifers entered in Class* 119 *only.* [2 entries.]

1008 **I.** (£10.)—W. P. VOSPER, Merafield, Plympton, for **Primula 2nd** 3937, born Jan. 31, 1898, in-milk, calved March 1, 1906; *s.* Prince Edward 517, *d.* Primula 829 *by* Prince.

1007 **II.** (£5.)—W. P. VOSPER, for **Margaret** 4057, born Aug. 1, 1900, in-milk, calved March 11, 1906, bred by the late B. W. Coaker, Old Newham, Plympton; *s.* Minor 1026, *d.* Beauty 2nd 2471.

Sussex.[2]

Class 121.—*Sussex Bulls, calved in* 1902 or 1903. [4 entries, 2 absent.]

1010 **I.** (£15, & **Champion.**[3])—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for **Mayor** 1883, born Feb. 13, 1902; *s.* Diploma 1540, *d.* Meadow Sweet 7594 *by* Vickress 1364.

1011 **II.** (£10.)—C. J. LUCAS, Warnham Court, Sussex, for **Lord Eric** 1990, born March 10, 1903; *s.* Alfred 1637, *d.* Aldon Prebble A 6056 *by* Red Hill Goldust 927.

Class 122.—*Sussex Bulls, calved in* 1904. [3 entries, 1 absent.]

1014 **I.** (£15, & **R. N. for Champion.**[3])—E. E. BRABY, Drungewick Manor House, Rudgwick, for **Lord of Drungewick 5th** 2038, born Jan. 6; *s.* Duke of Drungewick 3rd 1808, *d.* Ladysmith 7887 *by* Prince of Drungewick 1530.

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[1] Champion Prize of £10 10*s.* given by the Devon Cattle Breeders' Society for the best Devon Cow or Heifer in Classes 115-117.

[2] The sum of £54 towards these Prizes was given by the Sussex Herd Book Society.

[3] Silver Medal given by the Sussex Herd Book Society for the best Sussex Bull in Classes 121-123.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

1016 **II.** (£10.)—A. J. HICKMAN, Court Lodge, Egerton, Kent, for **Prince of Drungewick 5th** 2039, born April 8, bred by E. E. Braby, Rudgwick; *s.* Duke of Drungewick 3rd 1808, *d.* Queen Bess 8163 *by* Loyalty 1531.

Class 123.—*Sussex Bulls, calved in* 1905. [7 entries, 1 absent.]

1022 **I.** (£15.)—EARL WINTERTON, Shillinglee Park, Petworth, for **Shillinglee Gold 2nd,** born June 5; *s.* Tutsham Gold 1946, *d.* Sportive 2nd 8372 *by* Brantridge Duke 1408.

1021 **II.** (£10.)—PHILIP SAILLARD, Buchan Hill, Crawley, for **Bewbush Duke,** born June 7; *s.* Bewbush Marquis 6720, *d.* Kitty 6645 *by* Silversmith 2nd 1115.

1017 **III.** (£4.)—E. E. BRABY, Drungewick Manor House, Rudgwick, for **Alfred of Drungewick,** born Jan. 26; *s.* Alfred 1637, *d.* British Beauty 8159 *by* Drungewick Prebble 1666.

1023 **R. N. & H. C.**—EARL WINTERTON, for **Shillinglee Gold 3rd.**

Class 124.—*Sussex Cows or Heifers* (*in-milk*), *calved before or in* 1903. [5 entries, 1 absent.]

1028 **I.** (£15, & Champion.[1])—EARL WINTERTON, Shillinglee Park, Petworth, for **Sunlight 5th** 9441, born Jan. 13, 1903, in-milk, calved Jan. 18, 1906; *s.* Drungewick Prebble 1666, *d.* Sunlight 3rd 8127 *by* Brantridge Duke 1408.

1025 **II.** (£10.)—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for **Fancy** 7919, born Aug. 15, 1899, in-milk, calved Sept. 29, 1905; *s.* Diploma 1540, *d.* Frisky 6498 *by* Gladiator 1171.

1027 **III.** (£4.)—W. F. WINCH, Tilsden, Cranbrook, for **Warden Lady** 9103, born Feb. 15, 1902, in-milk, calved May 8, 1906, bred by Mr. Hawes, Wateringbury, Kent; *s.* Tutsham Rival 1757, *d.* Warden Crumple 7977 *by* Chatham 1508.

1026 **R. N. & H. C.**—THE HON. R. P. NEVILL, for **Old Mayflower 8th.**

Class 125.—*Sussex Heifers, calved in* 1904. [8 entries, none absent.]

1036 **I.** (£15.)—EARL WINTERTON, Shillinglee Park, Petworth, for **Sunlight 7th** 9929, born Feb. 1; *s.* Bewbush 1943, *d.* Sunlight 3rd 8127 *by* Brantridge Duke 1408.

1033 **II.** (£10.)—THE HON. R. P. NEVILL, Birling Manor, West Malling, for **Birling Eleanor** 9809, born Feb. 18; *s.* Lord Comp 1778, *d.* Ellen 7211 *by* Oxford Duke 1st 840.

1029 **III.** (£4.)—JOHN AUNGIER, Lynwick, Rudgwick, for **Gwendolen of Lynwick** 9493, born Jan. 31, bred by J. B. Powell, Old Place, Mayfield; *s.* Merchant Prince 4th 1826, *d.* Gwendolen 8317 *by* Buckwood Lad 4th 1654.

1031 **R. N. & H. C.**—F. S. W. CORNWALLIS, Linton Park, Maidstone, for **Linton Hepatica.**

Class 126.—*Sussex Heifers, calved in* 1905. [12 entries, 3 absent.]

1045 **I.** (£15, & R. N. for Champion.[1])—PHILIP SAILLARD, Buchan Hill, Crawley, for **Bewbush Evelyn,** born Jan. 5; *s.* Bewbush Marquis 1720, *d.* Aldon Woodmancote 1st 6668 *by* Headley 1201.

1040 **II.** (£10.)—THE EARL OF DERBY, K.G., Orchardmains, Tonbridge, for **Display,** born Jan. 4; *s.* Dragoon 1881, *d.* Dovelet 8841 *by* Grazer 1684.

1037 **III.** (£4.)—JOHN AUNGIER, Lynwick, Rudgwick, for **Bewbush Rosalind 4th** 9981, born Jan. 3; *s.* Alfred 1637, *d.* Bewbush Rosalind 2nd 8080 *by* Buccaneer 1577.

1046 **R. N. & H. C.**—W. F. WINCH, Tilsden, Cranbrook, for **Tilsden Jessie.**

Welsh.

Class 127.—*Welsh Bulls, calved in* 1902, 1903, *or* 1904. [5 entries, none absent.]

1049 **I.** (£10, & R. N. for Champion.[2])—DAVIES, THOMAS & HOWELLS, Mydrim, Saint Clears, for **Duke of Connaught** 248, born Oct. 20, 1902, bred by J. C. Yorke, Langton, Dwrbach, Pembrokeshire; *s.* Duke of York 247, *d.* Daisy 694.

1050 **II.** (£6.)—R. M. GREAVES, Wern, Portmadoc, for **The Czar,** born Aug. 20, 1902, bred by W. E. Oakeley, The Plas, Tan-y-bwlch; *s.* Leporello 521, *d.* Pretoria 1347 *by* Cawr.

1051 **III.** (£4.)—LORD HARLECH, Glyn, Talsarnau, for **Rhodes** 57, born Feb. 13, 1904; *s.* Kopje 459, *d.* Miss Vaughan *by* Llandecwyn 343.

1053 **R. N. & H. C.**—UNIVERSITY COLLEGE OF NORTH WALES, for **Plaswr** 17.

Class 128.—*Welsh Bulls, calved in* 1905. [2 entries.]

1054 **I.** (£10, & Champion.[2])—R. M. GREAVES, Wern, Portmadoc, for **Wern Emperor** 50, born March 3; *s.* Wern Boy 43, *d.* Beuno Bach.

1055 **II.** (£6.)—JOHN WILLIAMS, Cefenfarchen, Llanfallteg, R.S.O., for **Derw Lad,** born Jan. 16, bred by John Owen, Brynderw, Whitland, R.S.O.; *s.* Lloffwr 286, *d.* Pensquare *by* Beryls Boy 292.

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[1] Silver Medal given by the Sussex Herd Book Society for the best Sussex Cow or Heifer in Classes 124-126.

[2] Champion Prize of £5 5*s.* given by the Welsh Black Cattle Society for the best Welsh Bull in Classes 127 and 128.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 129.—*Welsh Cows or Heifers (in-milk), calved before or in* 1903. [3 entries.]

1056 **I.** (£10.)—R. M. GREAVES, Wern. Portmadoc, for **Glasfryn Cadie,** born 1898, in-milk, calved June 2, 1906, bred by Thomas Parry, Pendre, Aberdaron : *s.* Tom, *d.* Nancy.
1057 **II.** (£6.)—R. M. GREAVES, for **Pyrites 2nd** 1190, born Jan. 3, 1898, in-milk, calved June 5, 1906, bred by W. E. Oakeley, The Plas, Tan-y-bwlch ; *s.* Hwfa 420, *d.* Pyrites *by* Ardudwy.
1058 **III.** (£4.)—UNIVERSITY COLLEGE OF NORTH WALES, Madryn, Aber, Bangor, for **Madryn Sally** 595, born June 8, 1899, in-milk, calved Jan. 17, 1906, bred by R. M. Greaves, Wern, Portmadoc ; *s.* Black Bear, *d.* Lady Sarah 2nd.

Class 130.—*Welsh Heifers, calved in* 1904 *or* 1905. [6 entries, none absent.]

1062 **I.** (£10.)—ROBERT ROBERTS, Bronygadair, Portmadoc, for **Laura,** born June 30, 1904 ; *s.* Madoc Bach, *d.* Blodwen.
1060 **II.** (£6.)—R M. GREAVES, Wern, Portmadoc, for **Abbess 5th** 196, born Feb. 12, 1904, bred by The Coed Coch Trustees, Derwas, Abergele ; *s* Kohinoor 541, *d.* Abbess 4th.
1063 **III.** (£4.)—UNIVERSITY COLLEGE OF NORTH WALES, Madryn, Aber, Bangor, for **Madryn Sally 2nd,** born Feb. 12, 1905 ; *s.* Madryn Duke 182, *d.* Madryn Sally 595 *by* Black Bear.
1061 **R. N. & H. C.**—ROBERT ROBERTS, for **Jenny.**

Red Polled.[1]

Class 131.—*Red Polled Bulls, calved in* 1902 *or* 1903. [5 entries, none absent.]

1067 **I.** (£10, & Champion.[2])—HARCOURT DAPLYN, Church Farm, Hindringham, Walsingham, for **Davyson 224th** 9059, born April 27, 1902, bred by J. Hammond, Bale, Dereham ; *s.* Handyman 8213, *d.* Dairy 155th 10149 *by* Davyson 78th 3067.
1066 **II.** (£6, & R. N. for Champion.[2])—SIR RICHARD COOPER, BT., Ashlyns, Berkhamsted, for **Ashlyns Major** 9192, born Jan. 4, 1903 ; *s.* Lord Rosebery 8383, *d.* Wilby 2nd 10893 *by* Game Boy 2315.
1069 **III.** (£4.)—A. J. SMITH, Rendlesham, Woodbridge, for **Rendlesham Knockin** 9481, born April 17 ; *s.* Roger Knockin 8671, *d.* Miss Glaze 2nd 12667 *by* Red Prince 2902.
1065 **R. N. & H. C.**—F. H. BAXENDALE, Framfield, Uckfield, for **Flaxmoor Firebrand.**

Class 132.—*Red Polled Bulls, calved in* 1904. [8 entries, none absent.]

1072 **I.** (£10.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Acton Rufus** 9354, born Jan. 20 ; *s.* Lord Rattler 8977. *d.* Acton Cherry 17878 *by* Logan 6391.
1070 **II.** (£6.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Darius** 9403, born Feb. 17 ; *s.* Defiance 6966, *d.* Wax Doll 3rd 9899 *by* Red Shirt 2014.
1071 **III.** (£4.)—SIR RICHARD COOPER, BT., Ashlyns, Berkhamsted, for **Ashlyns Ben** 9361, born March 1 ; *s.* Felix 7066, *d.* Minnie 8045 *by* Earl 2279.
1077 **R. N. & H. C.**—G. D. SMITH, Strensham Court, Worcester, for **Warwick.**

Class 133.—*Red Polled Bulls, calved in* 1905. [11 entries, 1 absent.]

1078 **I.** (£10.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Dax** born May 13 : *s.* Defiance 6966, *d.* Nellie 6th 17264 *by* Redvers 6570.
1081 **II.** (£6.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Acton Czar,** born Jan. 28, bred by Garrett Taylor, Trowse House, Norwich ; *s.* Kruger 9115, *d.* Coronet 3rd 14723 *by* Redmond 5147.
1083 **III.** (£4.)—R. HARVEY MASON, Necton Hall, Swaffham, for **Davyson 289th,** born April 3, bred by J. Hammond, Bale, Dereham ; *s.* Majiolini 3600, *d.* Davy 203rd 14789 *by* Beaufleur 4782.
1079 **R. N. & H. C.**—SIR RICHARD COOPER, BT., Berkhamsted for **Ashlyns Duke.**

Class 134.—*Red Polled Cows or Heifers (in-milk), calved before or in* 1903. [8 entries, 1 absent.]

1092 **I.** (£10. & Champion.[3])—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Tiff 4th** 18370, born Feb. 18, 1901, in-milk, calved Jan. 1, 1906, bred by Garrett Taylor, Trowse House, Norwich : *s.* Redmond 5147, *d.* Tiff 2nd 6814 *by* Cromwell 647.
1089 **II.** (£6, & R. N. for Champion.[3])—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Waxlight 2nd** 18965, born Feb. 26, 1902, in-milk, calved Jan. 30, 1906 ; *s.* Royal Standard 8707, *d.* Wax Doll 2nd 9068 *by* Red Shirt 2014.
1096 **III.** (£4.)—G. D. SMITH, Strensham Court, Worcester, for **Lollypop** 8146, born Jan. 5, 1900, in-milk, calved April 5, 1906 ; *s.* Hastoe Banker 5554, *d.* Sweetmeat 11875 *by* Daisy King 4322.
1090 **R. N. & H. C.**—SIR WALTER CORBET, BT., for **Biddy 2nd.**

[1] The sum of £20 towards these Prizes was given by the Red Polled Cattle Society.
[2] Champion Prize of £10 given by the Derby Local Committee for the best Red Polled Bull in Classes 131 and 132.
[3] Champion Prize of £10 given by the Derby Local Committee for the best Red Polled Cow or Heifer in Classes 134-136.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 135.—*Red Polled Heifers, calved in* 1904. [8 entries, none absent.]

1101 **I.** (£10.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Davy 280th** 19711, born Feb. 11, bred by J. Hammond, Bale, Dereham; *s.* Majiolini 3600, *d.* Davy 190th 13389 *by* Beaufleur 4782.

1097 **II.** (£6.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Satanita 6th** 20069, born Jan. 24; *s.* Royal Standard 8707, *d.* Satanita 2nd 11831 *by* Didlington Davyson 5th 2263.

1099 **III.** (£4.)—SIR RICHARD COOPER, BT., Ashlyns, Berkhamsted, for **Ashlyns Flirt** 19612, born Jan. 31; *s.* Ashlyns Frinton 7804, *d.* Ashlyns Folly 16131 *by* Matabele 4522.

1102 **R. N. & H. C.**—J. B. DIMMOCK, Shotford Hall, Harleston, for **Starston Mystery.**

Class 136.—*Red Polled Heifers, calved in* 1905. [9 entries, 3 absent.]

1109 **I.** (£10.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Acton Beryl**, born Jan. 16: *s.* Albert 7789, *d.* Acton Ruby 14423 *by* Red Lord 5820.

1110 **II.** (£6.)—SIR WALTER CORBET, BT., for **Acton Cranberry**, born Jan. 19; *s.* Edward 9076, *d.* Acton Cherry 17878 *by* Logan 6391.

1105 **III.** (£4.)—LORD AMHERST OF HACKNEY, Didlington Hall, Stoke Ferry, for **Popsey 8th**, born Jan. 7; *s.* Defiance 6966, *d.* Popsey 6th 17392 *by* Redvers 6570.

1106 **R. N. & H. C.**—F. H. BAXENDALE, Framfield Place, Uckfield, for **Castille.**

Class 137.—*Milk Yield Prizes, open to Red Polled Cows and Heifers entered in Class* 134 *only.* [6 entries, none absent.]

1091 **I.** (£10.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury, for **Linda 3rd** 13767, born April 20, 1898, in-milk, calved April 29, 1906, bred by Garrett Taylor, Trowse House, Norwich; *s.* Planet 4579, *d.* Linda 5650 *by* Togo 1025.

1093 **II.** (£5.)—LORD ROTHSCHILD, Tring Park, Herts., for **Clarissa** 13315, born Dec. 1, 1898, in-milk, calved May 9, 1906, bred by Garrett Taylor, Trowse House, Norwich; *s.* Redmond 5147, *d.* Chrissy 6246 *by* Master Falstaff 1233.

1094 **III.** (£3.)—LORD ROTHSCHILD, for **Passion Flower** 17334, born Aug. 18, 1900, in-milk, calved April 16, 1906; *s.* General 6234, *d.* Hastoe Pretty 12403 *by* Playford Comedy.

Aberdeen Angus.

Class 138.—*Aberdeen Angus Bulls, calved on or after December* 1, 1901, *and before December* 1, 1903. [9 entries, 1 absent.]

1119 **I.** (£10, & **Champion.**[1])—G. S. GRANT, Auchorachan, Glenlivet, for **Prince Forest** 21106, born March 5, 1902, bred by Sir G. M. Grant, Bt., Ballindalloch Castle, Morayshire: *s.* Delamere 13305, *d.* Pride of the Forest 26915 *by* Entertainer 13373.

1121 **II.** (£6.)—JOHN MACPHERSON, Mulben, Keith, for **Khartoum of Ballindalloch** 20732, born Dec. 28, 1901, bred by Sir G. M. Grant, Bt., Ballindalloch Castle, Morayshire; *s.* Delamere 13305, *d.* Kindred 12436 *by* Errol 2723.

1114 **III.** (£4.)—T. H. BAINBRIDGE, Eshott Hall, Felton, for **Idelamere** 22036, born Feb. 23, 1903; *s.* Maramere 18160, *d.* Ideal 26739 *by* Mailbag 13637.

1116 **R. N. & H. C.**—J. J. CRIDLAN, for **Wizard of Maisemore.**

Class 139.—*Aberdeen Angus Bulls, calved on or after December* 1, 1903, *and before December* 1, 1904. [13 entries, 3 absent.]

1126 **I.** (£10, & **R. N. for Champion.**[1])—EDWARD COEY, Droagh, Larne, for **Tam of Ardargie** 23991, born Jan. 22, 1904, bred by J. Calder, Ledlanet, Milnathort; *s.* Eimeo 12450, *d.* Princess of Ardargie 33283 *by* Price List 17069.

1131 **II.** (£6.)—W. B. GREENFIELD, Haynes Park, Bedford, for **Royal Rover of Haynes 2nd** 25093, born July 28, 1904; *s.* Just Rover of Morlich 15605, *d.* Real Ruth 22519 *by* Cerberus 8181.

1133 **III.** (£4.)—THE DUKE OF PORTLAND, K.G., Welbeck Abbey, Worksop, for **Evasor** 23196, born Dec. 7, 1903, bred by J. Kennedy, Doonholm, Ayr; *s.* Mondamin 18240, *d.* Evasion of Preston 27939 *by* Rhombus of Glamis 13901.

1130 **R. N. & H. C.**—G. SMITH GRANT, Auchorachan, Glenlivet, for **Ephorus.**

Class 140.—*Aberdeen Angus Bulls, calved on or after December* 1, 1904, *and before December* 1, 1905. [13 entries, 1 absent.]

1143 **I.** (£10.)—J. R. FINDLAY, Aberlour, for **Blizzard** 24175, born Jan. 27, 1905, bred by W. S. Adamson, Careston Castle, Brechin; *s.* Buskin 20222, *d.* Benefactress of Careston 34966 *by* Charcoal 17611.

1140 **II.** (£6.)—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, for **Everwise** 24436 born Jan. 19, 1905; *s.* Wizard of Maisemore 21465, *d.* Evergreen 7th 33414 *by* Eimeo 12450.

1138 **III.** (£4.)—J. J. CRIDLAN, for **Bengal of Ballindalloch** 24148, born Dec. 3, 1904, bred by Sir G. M. Grant, Bt., Ballindalloch Castle, Morayshire; *s.* Eblamere 21781, *d.* Benign Maid 31933 *by* Bion 11454.

1139 **R. N. & H. C.**—J. J. CRIDLAN, for **Everall.**

[1] Gold Medal given by the Polled Cattle Society for the best Aberdeen Angus Animal in Classes 138-143.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 141.—*Aberdeen Angus Cows or Heifers (in-milk), calved before December* 1, 1903. [15 entries, none absent.]

1157 **I.** (£10, & Champion.[1])—W. B. GREENFIELD, Haynes Park, Bedford, for **Darling of Haynes 2nd** 32047, born Dec. 25, 1900, in-milk, calved Sept. 3, 1905 ; *s.* Just Rover of Morlick 15605, *d.* Darling of Flamsteadbury 26991 *by* King of Paris 6869.

1150 **II.** (£6.)—J. H. BRIDGES, Langshott, Horley, for **Barbarina 2nd** 31391, born Jan. 10, 1901, in-milk, calved Dec. 23, 1905 ; *s.* Equerry of Ballindalloch 9136, *d.* Barberry of Laughton 22079 *by* Jovial Souter 7634.

1159 **III.** (£4.)—R. W. HUDSON, Danesfield, Marlow, for **Waterlily 5th of Skegby** 31505, born Feb. 22, 1901, in-milk, calved Jan. 7, 1906, bred by Casswell Bros., Skegby Lincs. ; *s.* Count Fluster 16409, *d.* Waterlily 3rd of Skegby 28032 *by* Quince 13886.

1154 **R. N. & H. C.**—J. J. CRIDLAN, for **Opening Rose.**

Class 142.—*Aberdeen Angus Heifers, calved on or after December* 1, 1903, *and before December* 1, 1904. [7 entries, 1 absent.]

1168 **I.** (£10, & R. N. for Champion.[1])—G. S. GRANT, Auchorachan, Glenlivet, for **Pride of Spey 4th** 37292, born Dec. 2, 1903, bred by J. R. Findlay, Aberlour ; *s.* Echevin 17732, *d.* Pride of Guisachan 41st 18625 *by* Cash 4558.

1165 **II.** (£6.)—J. H. BRIDGES, Langshott, Horley, for **Laurel of Langshott 5th** 36905, born Jan. 18, 1904 ; *s.* Equerry of Ballindalloch 9136, *d.* Laurel of Langshott 2nd 27960 *by* Jackanapes of Ballindalloch 13517.

1164 **III.** (£4.)—T. H. BAINBRIDGE, Eshott Hall, Felton, for **Elvena** 37446, born Feb. 25, 1904, bred by G. Grant, Finlarig, Boat of Garten, N.B. ; *s.* Edelhof 20416, *d.* Evasive of Clury 31974 *by* Eclipse of Balnorichk 15357.

1169 **R. N. & H. C.**—W. B. GREENFIELD, Haynes Park, Bedford, for **Evidence of Haynes.**

Class 143.—*Aberdeen Angus Heifers, calved on or after December* 1, 1904, *and before December* 1, 1905. [19 entries, 5 absent.]

1183 **I.** (£10.)—J. R. FINDLAY, Aberlour, for **Prize** 38913, born Dec. 6, 1904 ; *s.* Elaborator of Ballindalloch 21807, *d.* Pride of Honour 33608 *by* Performer of Aberlour 17018.

1178 **II.** (£6.)—SIR GEORGE A. COOPER, BT., Hursley Park, Winchester, for **Evera of Hursley** 38703, born Jan. 1, 1905 ; *s.* Evolsurus 21908, *d.* Eva 2nd of Coynachie 36636 *by* Escort of Aberlour 13389.

1179 **III.** (£4.)—J. J. CRIDLAN, Home Farm, Maisemore Park, Gloucester, for **Edaline** 38728, born Feb. 7, 1905 ; *s.* Wizard of Maisemore 21465, *d.* Edwina of Abergeldie 27814 *by* Juryman of Whitelumbs 16732.

1171 **R. N. & H. C.**—T. H. BAINBRIDGE, Eshott Hall, Felton, for **Coquette of Eshott.**

Galloways.

Class 144.—*Galloway Bulls, calved on or after Decemher* 1, 1901, *and before December* 1, 1904. [3 entries.]

1191 **I.** (£10, & Champion.[2])—JOHN CUNNINGHAM, Tarbreoch, Dalbeattie, for **Chancellor of Ballyboley** 9010, born May 28, 1903, bred by R. J. Calwell, Ballyboley, Co. Antrim ; *s.* Bondsman 7306, *d.* Marigold of Castlemilk 14679 *by* Lowlander 2nd of Tarbreoch.

1190 **II.** (£6.)—THE COUNTESS OF CARLISLE, Naworth Castle, Brampton, for **Bruce of Naworth** 9308 (late Kuroki of Craighouse), born March 3, 1904, bred by W. & D. Wilson, Craighouse, Lockerbie ; *s.* Woodland Prince 8772, *d.* Tibbie of Tundergarth 16987 *by* Macdougall of Naworth 6990.

1192 **R. N. & H. C.**—ROBERT GRAHAM, Auchengassel, Twynholm, for **Black Pearl.**

Class 145.—*Galloway Bulls, calved on or after December* 1, 1904, *and before Deeember* 1, 1905. [8 entries, 2 absent.]

1200 **I.** (£10, & R. N. for Champion.[2])—JAMES WILSON, Tundergarth Mains, Lockerbie, for **Warcry of Whitehill** 9566, born Jan. 18, 1905, bred by C. Little, Whitehill, Corrie, Lockerbie ; *s.* Warcry of Tundergarth Mains 8236, *d.* Nancy of Whitehill 18130 *by* Grace Royal 7123.

1193 **II.** (£6.)—T. BIGGAR & SONS, Chapelton, Dalbeattie, for **Javelin** 9441, born Jan. 3, 1905 ; *s.* Excelsior 7702, *d.* Golden Daisy 17421 *by* Golden Age 6660.

1199 **III.** (£4.)—THOMAS GRAHAM, Marchfield, Dumfries, for **Banker** 9509, born March 16, 1905, bred by J. & S. Nivison, Landlaugh, Dalbeattie ; *s.* Roberts 7869, *d.* Polly Macduff 15496 *by* Macduff 5905.

1195 **R. N. & H. C.**—JOHN CUNNINGHAM, Tarbreoch, Dalbeattie, for **Tarbreoch Allan.**

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[1] Gold Medal given by the English Aberdeen Angus Cattle Association for the best Animal of the opposite sex to that of the Animal awarded the Gold Medal of the Polled Cattle Society in Classes 138-143.

[2] Champion Prize of £5 5*s.* given by the Galloway Cattle Society for the best Galloway Bull in Classes 144 and 145.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 146.—*Galloway Cows or Heifers (in-milk), calved before December* 1, 1903. [4 entries, 1 absent.]

1202 **I.** (£10, & **Champion.**[1])—JOHN CUNNINGHAM, Tarbrcoch, Dalbeattie, for **Doris of Kilquhanity** 16912. born May 1, 1901, in-milk, calved March 12, 1906, bred by Robert Wilson, Kilquhanity, Dalbeattie; *s.* Great Scot 6489, *d.* Dora of Durhamhill 13550 *by* Campfollower 5042.

1203 **II.** (£6, & **R. N. for Champion.**[1])—JOHN CUNNINGHAM, for **Netty 32nd of Tarbreoch** 17996, born April 14, 1903, in-milk. calved Feb. 6, 1906, bred by W. & R. Clark, Culmain, Dumfries; *s.* Worthy 3rd 7762, *d.* Netty 30th of Culmain 16984 *by* Cedric 4th of Tarbreoch 6466.

1201 **III.** (£4.)—THE COUNTESS OF CARLISLE, Naworth Castle, Brampton, for **Janet of Naworth** 17541 (late Genetta of Harelawhill), born May 3, 1902, in-milk, calved Feb. 21, 1906, bred by W. Graham, Harelaw Hill, Canonbie; *s.* Scottish Borderer of Harelawhill 7800, *d.* Jubilee Countess 15073 *by* The Pathfinder 3rd 5991.

Class 147.—*Galloway Heifers, calved on or after December* 1, 1903, *and before December* 1, 1905. [9 entries, none absent.]

1205 **I.** (£10.)—T. BIGGAR & SONS. Chapelton, Dalbeattie, for **Bonnie Jean 6th** 18417, born Jan. 29, 1904; *s.* Excelsior 7702, *d.* Bonnie Jean of Chapelton 13998 *by* Mactavish.

1206 **II.** (£6.)—JOHN CUNNINGHAM, Tarbreoch, Dalbeattie, for **Louisa 5th of Tarbreoch** 18418. born June 15. 1904; *s.* Lord William of Durham Hill 7108, *d.* Louisa 2nd of Tarbreoch 17058 *by* Governor 7562.

1207 **III.** (£4.)—JOHN CUNNINGHAM, for **Miss Sally 7th of Tarbreoch** 18423, born March 3, 1904; *s.* Lord William of Durham Hill 7108, *d.* Miss Sally 2nd of Tarbreoch 17061 *by* Exquisite 7112.

1210 **R. N. & H. C.**—R. GRAHAM, Auchengassel, Twynholm, for **Young Lady Stanley.**

Highland.

Class 148.—*Highland Bulls, calved in* 1902 *or* 1903. [No entry.]

Class 149.—*Highland Cows or Heifers (in-milk), calved before or in* 1903. [2 entries.]

1215 **I.** (£10.)—H. C. STEPHENS, Cholderton, Salisbury, for **Learaig 3rd of Cholderton,** brindled, born Feb. 17, 1898, in-milk, calved April 20, 1906; *s.* Ceatharnach 642, *d.* Learaig 2nd of Cholderton 3401 *by* Calum Odhar of Atholl 79.

1214 **R. N. & H. C.**—H. C. STEPHENS, for **Cholderton Annag Riabhach.**

Ayrshires.

Class 150.—*Ayrshire Bulls, calved in* 1902, 1903, 1904, *or* 1905. [5 entries, 1 absent.]

1219 **I.** (£10.)—JAMES HOWIE, Hillhouse, Kilmarnock, for **Wynflette,** white with dark spots, born March 10 1902, bred by Robert Osborne, Morton Mains, Thornhill; *s.* Points of Merit of Wynholm 4258, *d.* Young Bonnie Jean of Wynholm 11054.

1216 **II.** (£6.)—THOMAS BARR, Monkland, Kilmarnock, for **Monkland Zomo-sal** 5887, white. born March 20, 1903; *s.* Netherhall Douglas Royal 5886, *d.* Monkland Rosalin *by* Galla Lad.

1218 **III.** (£4.)—JAMES HOWIE, for **Nether Craig Spicy Sam** 5927, white and brown spots, born Jan. 20, 1904, bred by Robert Forrest, Knockinlaw, Kilmarnock; *s.* Not Likely of Hillhouse 4469, *d.* Hareshaw 7th of Arcliarton 8324.

1220 **R. N. & H. C.**—ROBERT WOODBURN, Whitehill, Hurlford, for **Howie's Rising Sun.**

Class 151.—*Ayrshire Cows or Heifers (in-milk), calved before or in* 1903. [3 entries.]

1222 **I.** (£10.)—ALEXANDER CROSS, Knockdon Farm, Maybole, for **Knockdon Bright Mary** 15433, brown and white, born July 22, 1902, in-milk, calved May 28, 1906; *s.* Yellow Squire of Castle Hill 2912, *d.* Bright Maid 2nd of Knockdon 12469 *by* Flora's Chief 3955.

1223 **II.** (£6.)—ALEXANDER CROSS, for **Knockdon Lady Diana** 16726, brown and white, born April 8, 1903, in-milk, calved June 4, 1906: *s.* King's Knight of Auchentulloch 4888, *d.* Lady Jane of Knockdon 13820 *by* Prince 3rd 3689.

1221 **III.** (£4.)—THOMAS BARR, Monkland, Kilmarnock, for **Monkland Kate** 18953, white and brown, born April 12, 1902, in-milk, calved March 6, 1906, bred by William Sloan, Castle Mains, New Cumnock; *s.* Sergeant-Major of Castle Mains 4779, *d.* Kate *by* Craigman.

[1] Champion Prize of £5 5*s.* given by the Galloway Cattle Society for the best Galloway Cow or Heifer in Classes 146 and 147.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 152.—*Milk Yield Prizes, open to Ayrshire Cows and Heifers entered in Class* 151 *only.* [1 entry.]

1221 **I.** (£10.)—THOMAS BARR, Monkland, Kilmarnock, for **Monkland Kate** 18953, white and brown, born April 12, 1902, in-milk, calved March 6, 1906, bred by William Sloan, Castle Mains, New Cumnock ; *s.* Sergeant-Major of Castle Mains 4779, *d.* Kate *by* Craigman.

Jerseys.

N.B.—In the Jersey Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Island Herd Book. A number without brackets indicates that the animal is registered in the English Jersey Herd Book.

Class 153.—*Jersey Bulls, calved in* 1902 *or* 1903. [9 entries, 3 absent.]

1227 **I.** (£10.)—CAPT. L. G. GISBORNE, Allestree, Derby, for **Glorious Lad** 7824, whole colour, born March 5, 1902, bred by J. Le Sueur, St. Saviour's, Jersey ; *s.* Foxhill 7208 *d.* Glorious (7387) P.S.C. *by* Golden Lad 3324.

1226 **II.** (£6.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Gallant** 7816, whole colour, born July 17, 1902 ; *s.* Brompton 7118, *d.* Graphic 2nd *by* Hamley 6585.

1229 **III.** (£4.)—MRS. MCINTOSH, Havering Park, Romford, for **Black Pearl** 8087, whole colour, born May 20, 1903, bred by the Marquis of Winchester, Amport, Andover ; *s.* Distinction's Fox 7780, *d.* Roselaise Pearl *by* Pearl King 7322.

1224 **R. N. & H. C.**—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds, for **Topper.**

Class 154.—*Jersey Bulls, calved in* 1904. [15 entries, 3 absent.]

1242 **I.** (£10.)—W. B. RODERICK, Fronheulog, Llanelly, for **Aurifer** (3716), dark grey, born Feb. 27, bred by R. A. Pepin, St. Saviour's, Jersey ; *s.* Leda's Golden Lad (7568), *d.* Fawn Lass (6462) *by* Gamboge Lad 5169.

1244 **II.** (£6.)—G. MURRAY SMITH, Gumley Hall, Market Harborough, for **Smiler** 8372, whole colour, born March 6, bred by J. Cabot, jun., Trinity, Jersey ; *s.* Leda's Golden Lad (7568), *d.* Imogene 2nd (9596) *by* Flying Fox (6859).

1246 **III.** (£4.)—SIR EDWARD D. STERN, Fan Court, Chertsey, for **Silken Fop,** dark grey, born June 27, bred by R. B. Ward, Westwood Park, Droitwich ; *s.* Silken Lad 7666, *d.* Phyllis 13th *by* Darby 7163.

1233 **R. N. & H. C.**—L. CURRIE, Minley Manor, Farnborough, for **Twylish King.**

Class 155.—*Jersey Bulls, calved in* 1905. [24 entries, 9 absent.]

1267 **I.** (£10.)—LORD ROTHSCHILD, Tring Park, Herts., for **Royal Ensign,** whole colour, born June 1 ; *s.* Franc Fiefs Jolly 8187, *d.* Lady Rotha (vol. 14, p. 287) *by* Red Rover.

1264 **II.** (£6.)—A. MILLER-HALLETT, Goddington, Chelsfield, for **Alfriston's Pride,** whole colour, born July 19 ; *s.* Goddington Brownie, *d.* Alfriston Gem *by* Golden Lad 3324.

1248 **III.** (£4.)—W. A. H. BASS, Byrkley Lodge, Burton-on-Trent, for **Blackthorn,** dark fawn, born June 9, bred by the Marquis of Winchester, Amport, Andover ; *s.* Black Pearl (vol. 15, p. 146), *d.* Henbury Gentle 2nd *by* Boyles Glory 6795.

1253 **R. N. & H. C.**—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Crusader.**

Class 156.—*Jersey Cows or Heifers (in-milk), calved before or in* 1903. [31 entries, 7 absent.]

1285 **I.** (£10.)—A. MILLER-HALLETT, Goddington, Chelsfield, for **Lady Viola** (8463), whole colour, born April 28, 1899, in-milk, calved April 10, 1906, bred by J. W. Boutillier, St. Owen's, Jersey ; *s.* Nobleman (2553), *d.* Bagatelle 2nd *by* Golden Lad.

1297 **II.** (£6.)—J. H. SMITH-BARRY, Stowell Park, Pewsey, for **Lady May** (vol. 14, p. 296), grey and white, born March 12, 1900, in-milk, calved April 27, 1906, bred by N. A. Le Quesne, Jersey ; *s.* Slip 6712, *d.* La Jalousie *by* Unas Boy 5042.

1277 **III.** (£4.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Whitewood 5th** (vol. 11, p. 347), whole colour, born Feb. 23, 1898, in-milk, calved May 14, 1906, bred by J. J. Shepherd, Grange over Sands ; *s.* Drummer 5865, *d.* Whitewood 3rd *by* Grey Boy.

1302 **R. N. & H. C.**—R. BRUCE WARD, Westwood Park, Droitwich, for **Mrs. Viola.**

Class 157.—*Jersey Heifers (in-milk), calved in* 1904. [24 entries, 10 absent.]

1317 **I.** (£10.)—MRS. MCINTOSH, Havering Park, Romford, for **Frolicsome 5th,** whole colour, born Jan. 1, in-milk, calved April 16, 1906, bred by Peter Andeani, Jersey ; *s.* Sam Loates 3094, *d.* Frolicsome 2nd *by* Golden Pink 1491.

1309 **II.** (£6.)—LADY DE ROTHSCHILD, Aston Clinton, Tring, for **Watercress** (vol. 16, p. 104), whole colour, born Feb. 20, in-milk, calved April 9, 1906 ; *s.* Oxford Brigadier 7320, *d.* Witch (vol. 16, p. 413) *by* Narcissus 5663.

1318 **III.** (£4.)—T. B. MILLER, Manor House, Cricklade, for **My Fancy,** whole colour, born April 28, in-milk, calved May 28, 1906, bred by N. A. Le Quesne, Trinity, Jersey ; *s.* Hearty Fox 3365, *d.* Dainty Bella 10211.

1304 **R. N. & H. C.**—EARL CADOGAN, K.G., for **Bee Line.**

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 158.—*Jersey Heifers, calved in* 1905. [24 entries, 9 absent.]

1335 **I.** (£10.)—JAMES JOICEY, Poulton Priory, Fairford, for **Electress,** whole colour, born May 29 ; *s.* Chief Justice 7138, *d.* Electric Flash *by* Flying Fox 6859.

1334 **II.** (£6.)—CAPT. L. G. GISBORNE, Allestree, Derby, for **Lady Madcap,** whole colour, born April 21 ; *s.* Jolly Rosebay 3595, *d.* Glendora *by* Goldworthy 8216.

1330 **III.** (£4.)—LAURENCE CURRIE, Minley Manor, Farnborough, for **Marjory,** whole colour, born April 6 ; *s.* Golden Summer 7841, *d.* Dusky Jane *by* Bessies Knight 6781.

1338 **R. N. & H. C.**—MRS. MCINTOSH, Havering Park, Romford, for **Havering Glorissa 6th.**

Class 159.—*Milk Yield Prizes, open to Jersey Cows and Heifers entered in Classes* 156 *or* 157 *only.* [15 entries, 3 absent.]

1300 **I.** (£10.)—MAJOR TENNANT, St. Anne's Manor, Sutton, Loughborough, for **Daisy** (vol. 16, p. 269), fawn, born March, 1900, in-milk, calved Feb. 22, 1906, bred by T. Beeley, Market Place, Loughborough ; *s.* Campboy 8104, *d.* Katherine *by* Halimoden Iron 4166.

1279 **II.** (£5.)—THE RT. REV. BISHOP FISHER, D.D., Burgh House, Great Yarmouth, for **Oxford Dewdrop** (vol. 11, p. 302), fawn and white, born March 28, 1897, in-milk, calved March 28, 1906, bred by Lord Rothschild, Tring Park ; *s.* Planet 5332, *d.* Oxford Daffodil (vol. 6, p. 450) *by* Nunthorpe 4648.

1294 **III.** (£3.)—LORD ROTHSCHILD, Tring Park, Herts., for **Syren 3rd** (vol. 10, p. 346), broken colour, born April 26, 1896, in-milk, calved March 23, 1906, bred by J. Le Ruez, St. Owen's, Jersey ; *s.* La Chasse Prince 5243, *d.* Syren 2596 *by* Volunteer 2983.

1284 **R. N. & H. C.**—A. MILLER-HALLETT, Goddington, Chelsfield, for **Golfiner.**

Guernseys.

N.B.—Unless otherwise stated, the numbers refer to the English Guernsey Herd Book.

Class 160.—*Guernsey Bulls, calved in* 1902 *or* 1903. [3 entries, 2 absent.]

1352 **I.** (£10.)—H. FITZWALTER PLUMPTRE, Goodnestone, Dover, for **Roland of Seaview 10th** 1621, fawn and white, born Aug. 8, 1903, bred by W. A. Glynn, Seagrove, Seaview, Isle of Wight ; *s.* Roland of Seaview 2nd 1243, *d.* Seaview Rose 3921 *by* Billy.

Class 161.—*Guernsey Bulls, calved in* 1904. [4 entries, 1 absent.]

1355 **I.** (£10.)—FRANK HARGREAVES, Merton Grange, Gamlingay, Cambs., for **Merton Signet** 1691, red and little white, born May 20 ; *s.* Reuben 2nd 1416, *d.* Signalmina 4647 *by* Signalman 585.

1357 **II.** (£6.)—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **St. Amant** 1462, P.S., R.G.A.S., fawn, born April 21 ; *s.* Golden Secret 1314, P.S., R.G.A.S., *d.* Sweet Fragrance 4820, P.S., R.G.A.S.

1354 **R. N. & H. C.**—FRANK HARGREAVES, for **Merton Dairyman.**

Class 162.—*Guernsey Bulls, calved in* 1905. [8 entries, 4 absent.]

1359 **I.** (£10.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Prince Mino** 1776, fawn and white, born March 15, bred by W. de Gruchy, St. Saviour's, Guernsey ; *s.* Mino 1415, P.S., R.G.A.S., *d.* Daisy of Sous D'Eglise 2120, F.S., R.G.A.S.

1358 **II.** (£6.)—E. A. HAMBRO, for **Itchen Royal** 1756, fawn and white, born Feb. 7, bred by Lady Tichborne, Alresford ; *s.* Golden Secret 1569, *d.* Royal Rose 4279.

1360 **R. N. & H. C.**—FRANK HARGREAVES, Merton Grange, Gamlingay, for **Braye Boy.**

Class 163.—*Guernsey Cows or Heifers (in-milk), calved before or in* 1903. [13 entries, 3 absent.]

1370 **I.** (£10, & **Champion.**[1])—FRANK HARGREAVES, Merton Grange, Gamlingay Cambs., for **Merton Beauty of the Villiage** 6249, red and little white, born Jan. 9, 1902, in-milk, calved May 21, 1906, bred by Elizee Brouard, St. Andrews, Guernsey, *s.* Ransom 3rd, *d.* Beauty of the Villiage.

1376 **II.** (£6.)—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Lady Roberts** 2116, F.S., R.G.A.S., fawn and white, born Feb. 5, 1895, in-milk, calved April 19, 1906, bred by C. Kelly, Little Street, Alderney.

1368 **III.** (£4.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Mrs. Dreyfus** 5937, fawn and white, born Aug. 26, 1900, in-milk, calved June 4, 1906, bred by H. M. Ozanne, Lilyvale, Castel, Guernsey ; *s.* Massachusetts 293, F.S., R.G.A.S., *d.* Mrs. Dreyfus 4348, P.S., R.G.A.S.

1367 **R. N. & H. C.**—E. A. HAMBRO, for **Express.**

Class 164.—*Guernsey Heifers, calved in* 1904. [7 entries, 2 absent.]

1383 **I.** (£10, & **R. N. for Champion.**[1])—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Lady Roberts 3rd** 5170, P.S., R.G.A.S., red and white, born Feb. 15 ; *s.* Golden Secret 1314, P.S., R.G.A.S., *d.* Lady Roberts 2116, F.S., R.G.A.S.

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[1] Champion Cup, value £5, given by the English Guernsey Cattle Society for the best Guernsey Cow or Heifer in Classes 163-165, entered or eligible and sent for entry in the English Guernsey Herd Book.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

1381 **II.** (£6.)—FRANK HARGREAVES, Merton Grange, Gamlingay, Cambs., for **Daisy 2nd of La Hougue** 5762, P.S., R.G.A.S., pale red and white, born June 14, bred by J. Nicolle, Hougue, Castel, Guernsey; *s.* No Joke 1404, P.S., R.G.A.S., *d.* Daisy of La Hougue 2155, F.S., R.G.A.S.

1384 **III.** (£4.)—H. FITZWALTER PLUMPTRE, Goodnestone, Dover, for **Muriel 15th** 6285, red and white, born April 22; *s.* Suzerain 1252, *d.* Muriel 12th 5250 *by* Redpath 1242.

1379 **R. N. & H. C.**—F. S. W. CORNWALLIS, for **Linton Rosemary.**

Class 165.—*Guernsey Heifers, calved in* 1905. [9 entries, 3 absent.]

1387 **I.** (£10.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Hayes Montrose 2nd** 6549, orange and white, born May 15: *s.* Merry Boy 1586, *d.* Lady Montrose 5876.

1388 **II.** (£6.)—E. A. HAMBRO, for **Hayes Olive 4th** 6552, fawn and white, born Aug. 15; *s.* Coronation King 1556, *d.* Hayes Olive 5838.

1389 **III.** (£4.)—FRANK HARGREAVES, Merton Grange, Gamlingay, Cambs., for **Merton Rosette of the Gron 3rd** 6632, fawn and little white, born July 3; *s.* Merton Codina 1687, *d.* Merton Rosette of the Gron 6264.

1390 **R. N. & H. C.**—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Lucassienne 4th.**

Class 166.—*Milk Yield Prizes, open to Guernsey Cows and Heifers entered in Class* 163 *only.* [9 entries, 1 absent.]

1377 **I.** (£10.)—H. FITZWALTER PLUMPTRE, Goodnestone, Dover, for **Muriel 12th** 5250, fawn and white, born April 16, 1901, in-milk, calved April 30, 1906; *s.* Redpath 1242, *d.* Muriel 6th 2765 *by* Express 609.

1375 **II.** (£5.)—H. M. OZANNE, Lilyvale, Castel, Guernsey, for **Searchlight**, red and white, born Jan. 5, 1900, in-milk, calved June 1, 1906, bred by Col. Utermarck, Robais, Guernsey; *s.* France's Masher 1102, P.S., R.G.A.S.

1368 **III.** (£3.)—E. A. HAMBRO, Hayes Place, Hayes, Kent, for **Mrs. Dreyfus** 5937, fawn and white, born Aug. 26, 1900, in-milk, calved June 4, 1906, bred by H. M. Ozanne; *s.* Massachusetts 293, F.S., R.G.A.S., *d.* Mrs. Dreyfus 4348, P.S., R.G.A.S.

1372 **R. N. & H. C.**—SIR HENRY LENNARD, BT., West Wickham, Kent, for **Lady 77th.**

Longhorns.

Class 167.—*Longhorn Bulls, calved in* 1902, 1903, *or* 1904. [6 entries, none absent.]

1397 **I.** (£10.)—W. L. RILEY, Wyken House, Coventry, for **Wychnor Prince** 437, born March 25, 1902, bred by Basil T. Levett, Wychnor Park, Burton-on-Trent; *s.* Wychnor Primus 400, *d.* Primrose *by* Earl of Upton 10th 307.

1396 **II.** (£6.)—LORD GERARD, Eastwell Park, Ashford, Kent, for **Melcombe Emperor** 416, dark brindle and white, born April 20, 1903, bred by Capt. H. Jasper Selwyn, Rhyll Manor, Dulverton; *s.* Wootton Emperor 399, *d.* Melcombe Lovely *by* Melcombe Conqueror 324.

1400 **III.** (£4.)—W. SHAW, JUN., Fradley Old Hall, Lichfield, for **Fradley Monarch**, brindle and white, born Sept. 29, 1903; *s.* Wychnor Secundus 401, *d.* Mabel *by* Windsor 370.

1398 **R. N. & H. C.**—W. H. SALE, Arden Hill, Atherstone, for **Arden Nobleman.**

Class 168.—*Longhorn Bulls, calved in* 1905.[1] [4 entries, none absent.]

1404 **I.** (£6.)—W. H. SALE, Arden Hill, Atherstone, for **Arden Conqueror**, brindle and white, born Feb. 25; *s.* Young Bow Horn 438, *d.* Ibstock Dairymaid *by* Warwickshire Lad 369.

1402 **II.** (£4.)—LORD GERARD, Eastwell Park, Ashford, Kent, for **Eastwell Elegant**, dark brindle and white, born Jan. 1; *s.* Wootton Emperor 399, *d.* Black-eyed Susan 2nd *by* Wootton Wonder 371.

1401 **R. N. & H. C.**—MRS. CHEAPE, Bentley Manor, Redditch, for **Bentley Watchman.**

Class 169.—*Longhorn Cows or Heifers (in-milk), calved before or in* 1903. [7 entries, 1 absent.]

1409 **I.** (£10.)—W. H. SALE, Arden Hill, Atherstone, for **Fradley Queen** (vol. 4, p. 19), red and white, born Dec. 17, 1901, in-milk, calved Oct. 14, 1905; *s.* Romeo 2nd 349, *d.* Fradley Beauty *by* The Duke 361.

1405 **II.** (£6.)—MRS. M. M. CHEAPE, Bentley Manor, Redditch, for **Phœbe** (vol. 4, p. 28), brindle, born Aug. 25, 1900, in-milk, calved Jan. 4, 1906, bred by Capt. H. Jasper Selwyn, Leek Wootton; *s.* Kenilworth 317, *d.* Upton Brindle Beauty *by* Earl of Upton 10th 307.

1408 **III.** (£4.)—LORD GERARD, Eastwell Park, Ashford, Kent, for **Melcombe Damsel** (vol. 4, p. 22), dark brindle and white, born Nov. 9, 1901, in-milk, calved Nov. 8, 1905, bred by Capt. H. Jasper Selwyn, Rhyll Manor, Dulverton; *s.* Wootton Wonder 371, *d.* Melcombe Duchesse *by* Melcombe Conqueror 324.

1407 **R. N. & H. C.**—LORD GERARD, for **Black-eyed Susan 2nd.**

[1] Prizes given by the Longhorn Cattle Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 170.—*Longhorn Heifers, calved in* 1904 *or* 1905.[1] [3 entries.]

1412 I. (£6.)—LORD GERARD, Eastwell Park, Ashford, Kent, for **Bentley Dido,** dark brindle and white, born Jan. 11, 1904, bred by Mrs. M. M. Cheape, Bentley Manor, Redditch ; *s.* Bentley Wonder 373, *d.* Dido *by* Earl of Upton 11th 308.

1413 II. (£4.)—LORD GERARD, for **Ethel of Eastwell,** red and white, born Feb. 11, 1904 ; *s.* Young Kenilworth 439, *d.* Cowslip *by* Kenilworth 317.

1414 **R. N. & H. C.**—W. H. SALE, Arden Hill, Atherstone, for **Arden Dairymaid.**

Class 171.—*Milk Yield Prizes, open to Longhorn Cows and Heifers entered in Class* 169 *only.* [1 entry.]

1410 I. (£10.)—W. H. SALE, Arden Hill, Atherstone, for **Lady Panza** (vol. 4, p. 20), red and white, born Sept. 8, 1902, in-milk, calved May 2, 1906, bred by J. R. Watson, South Mosses, Lamplugh, Cumberland ; *s.* Sancho Panza 395, *d.* Bow Horn of Upton *by* Earl of Upton 10th 307.

Kerries.

N.B.—In the Kerry Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Kerry Herd Book. A number without brackets indicates that the animal is registered in the English Kerry Herd Book.

Class 172.—*Kerry Bulls, calved in* 1902, 1903, *or* 1904. [6 entries, 2 absent.]

1416 I. (£10, & **R. N. for Champion.**[2])—LADY GREENALL, Walton Hall, Warrington, for **Walton Rajah** 153, born March 14, 1904 ; *s.* Marquis 3rd of Carton 108, *d.* Waterville Begum 523.

1415 II. (£6.)—CLIFFORD J. CORY, M.P., Llantarnam Abbey, Mon., for **Llantarnam Lackey,** born June 27, 1903 ; *s.* La Mancha Tim 520, *d.* Grenagh Laura 2356.

1417 III. (£4.)—G. LL. PALMER, Lackham, Lacock, Wilts., for **Lackham Count,** born April 22, 1904, bred by D. M. Rattray, Gortnaskehy, Ballybunion, Co. Kerry ; *s.* Gort Desmond (546), *d.* Abbeyleix Loch Leane *by* Waterville Knight 53.

1418 **R. N. & H. C.**—SIR PETER WALKER, BT., Osmaston, Derby, for **Osmaston Briton.**

Class 173.—*Kerry Cows or Heifers (in-milk), calved before or in* 1903. [8 entries, none absent.]

1424 I. (£10, & **Champion.**[2])—THE DUCHESS OF NEWCASTLE, Clumber, Worksop, for **Hardwick Flora** 483, born April 23, 1898, in-milk, calved May 4, 1906 ; *s.* Kidmore Floral King 71, *d.* Sheen 5th 430 *by* The O'Dowd (112).

1423 II. (£6.)—LADY GREENALL, Walton Hall, Warrington, for **Walton Joyous** 574, born April 10, 1902, in-milk, calved April 28, 1906 ; *s.* Marquis 3rd of Carton 108, *d.* Walton Joy 507 *by* Coco (384).

1421 III. (£4.)—CLIFFORD J. CORY, M.P., Llantarnam Abbey, Mon., for **Patricia an Ceathramhadh** (2337), born April 13, 1896, in-milk, calved May 1, 1906, bred by the Earl of Aberdeen ; *s.* Desmond (285), *d.* Patricia an Treas (616) *by* Curoi (66).

1426 **R. N. & H. C.**—G. LL. PALMER, Lackham, Lacock, Wilts., for **Pretoria.**

Class 174.—*Kerry Heifers, calved in* 1904 *or* 1905.[3] [4 entries.]

1429 I. (£5.)—LADY GREENALL, Walton Hall, Warrington, for **Walton Marsupial,** born April, 1904, bred by the late J. E. Butler, Waterville ; *s.* Waterville Colonel 566.

1431 II. (£3.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **La Mancha Cloe,** born in 1904, breeder unknown.

1430 III. (£2.)—G. LL. PALMER, Lackham, Lacock, Wilts., for **Lackham Paddy,** born June 24, 1904 ; *s.* Shiplake King 132, *d.* Coronation *by* La Mancha Uncle Jim 105.

1432 **R. N. & H. C.**—SIR PETER WALKER, BT., Osmaston Manor, Derby, for **Young Burst.**

Class 175.—*Milk Yield Prizes, open to Kerry Cows and Heifers entered in Class* 173 *only.* [5 entries, none absent].

1423 I. (£10.)—LADY GREENALL, Walton Hall, Warrington, for **Walton Joyous** 574, born April 10, 1902, in-milk, calved April 28, 1906 ; *s.* Marquis 3rd of Carton 108, *d.* Walton Joy 507 *by* Coco (384).

1422 II. (£5.)—LADY GREENALL, for **Aicme Cold** 510, born about March, 1896, in-milk, calved April 30, 1906, breeder unknown.

1427 III. (£3.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **Belvedere Nora** 2982, born March 24, 1901, in-milk, calved May 3, 1906, bred by C. B. Warley, Belvedere, Mullingar ; *s.* Finn MacCumbail 445, *d.* Belvedere Beatrice 2218 *by* Black Prince 351.

1424 **R. N. & H. C.**—THE DUCHESS OF NEWCASTLE, for **Hardwick Flora.**

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[1] Prizes given by the Longhorn Cattle Society.

[2] Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best Kerry animal in Classes 172-174, the Cup to become the property of an Exhibitor winning it three years in succession.

[3] Prizes given by the English Kerry and Dexter Cattle Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Dexters.

N.B.—In the Dexter Classes, the number inserted within brackets after the name of an animal indicates the number of such animal in the Irish Dexter Herd Book. A number without brackets indicates that the animal is registered in the English Dexter Herd Book.

Class 176.—*Dexter Bulls, calved in* 1902, 1903, *or* 1904. [14 entries, 2 absent.]

1442 **I. (£10, & Champion.**[1])—H. M. GIBBS, Barrow Court, Bristol, for **Brockhampton Count** 255, black, born June 10, 1904, bred by A. W. Foster, Brockhampton Court, Ross; *s.* La Mancha Dick 157, *d.* Starlight *by* Baron Musar (445).

1433 **II.** (£6.)—G. J. B. CHETWYND, Wyndthorpe, Doncaster, for **Don Gentian** 244, black, born March 16, 1902, bred by Mrs. Leatham, Hinton House, Brackley; *s.* La Mancha Dick 157, *d.* Little Nell 650 *by* Grandaddy 200.

1438 **III.** (£4.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Compton Dash** 579, black, born in 1904, breeder unknown.

1437 **R. N. & H. C.**—THE DUCHESS OF DEVONSHIRE, for **Compton Dante.**

Class 177.—*Dexter Cows or Heifers (in-milk), calved before or in* 1903. [14 entries, 3 absent.]

1452 **I. (£10, & R. N. for Champion.**[1])—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Compton Daphne** 1067, black, born in 1900, in-milk, calved April 23, 1906, breeder unknown.

1451 **II.** (£6.)—BALDOMERO DE BERTODANO, Cowbridge House, Malmesbury, for **Cowbridge Lorna** 1163, black, born in March, 1900, in-milk, calved May 20, 1906, breeder unknown.

1458 **III.** (£4.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **Sprucefield Edna,** red, born in 1900, in-milk, calved May 26, 1906, breeder unknown.

1456 **R. N. & H. C.**—H. M. GIBBS, Barrow Court, Bristol, for **Barrow Gunga.**

Class 178.—*Dexter Heifers, calved in* 1904 *or* 1905.[2] [13 entries, 1 absent.]

1469 **I.** (£5.)—H. M. GIBBS, Barrow Court, Bristol, for **Barrow Duchess 2nd,** black, born June 6, 1904; *s.* Compton Dan 213, *d.* Barrow Duchess *by* Barrow Duke.

1473 **II.** (£3.)—THE COUNTESS OF SEFTON, Croxteth Hall, Liverpool, for **Altcar Sultana,** black, born April 7, 1905: *s.* Altcar Sultan 438, *d.* Gort Alice (115).

1461 **III.** (£2.)—G. J. B. CHETWYND, Wyndthorpe, Doncaster, for **Don Gentiana** 1133, black, born Aug. 20, 1904; *s.* Don Gentian 244, *d.* Don Gladiola 1088.

1472 **R. N. & H. C.**—THE COUNTESS OF SEFTON, for **Altcar Cistus.**

Class 179.—*Milk Yield Prizes, open to Dexter Cows and Heifers entered in Class* 177 *only.* [10 entries, 1 absent.]

1458 **I.** (£10.)—R. TAIT ROBERTSON, La Mancha, Malahide, Co. Dublin, for **Sprucefield Edna,** red, born in 1900, in-milk, calved May 26, 1906, breeder unknown.

1450 **II.** (£5.)—BALDOMERO DE BERTODANO, Cowbridge House, Malmesbury, for **Cowbridge Dainty Dish** 1261, black, born in March, 1902, in-milk, calved June 3, 1906, breeder unknown.

1452 **III.** (£3.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Compton Daphne** 1067, black, born in 1900, in-milk, calved April 23, 1906, breeder unknown.

1454 **R. N. & H. C.**—THE DUCHESS OF DEVONSHIRE, for **Compton Dorcas.**

Butter Tests. [35 entries, 7 absent.]

Class 180A.—*Cows, of any age, breed, or cross, exceeding* 900 *lb. live weight.*[3]

1481 **I. (£15, & S. P. £20.**[4])—REUBEN SHELTON, Grange Farm, Ruddington, Nottingham, for **Lady Mainstay** (Shorthorn), roan, born about 1898, calved May 22, 1906, breeder unknown.

1487 **II. (£10, & B. M.**[5])—DR. HERBERT WATNEY, Buckhold, Pangbourne, for **Red Maple** (Jersey) (vol. 8, p. 115), whole colour, born July 14, 1896, calved April 5, 1906; *s.* Savoy 5720, *d.* Golden Maple *by* Egyptian 4535.

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[1] Challenge Cup, value Twenty-five Guineas, given by the English Kerry and Dexter Cattle Society for the best Dexter Animal in Classes 176–178, the Cup to become the property of an Exhibitor winning it three years in succession.

[2] Prizes given by the English Kerry and Dexter Cattle Society.

[3] Prizes given by the English Jersey Cattle Society.

[4] Special Prizes of £20, £10, and £5, given by the English Jersey Cattle Society for the three Cows in Class 180A and 180B obtaining the greatest number of points in the competition.

[5] Gold, Silver, and Bronze Medals given by the English Jersey Cattle Society for the three Jersey animals entered or eligible for entry in the English Jersey Herd Book, which obtained the greatest number of points in the Butter Tests.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

1008 **III.** (£5.)—W. P. VOSPER, Merafield, Plympton, for **Primula 2nd** 3937, born Jan. 31, 1898, in-milk, calved March 1, 1906; *s.* Prince Edward 517, *d.* Primula 829 *by* Prince.

1478 **R. N. & H. C.**—JOHN EVENS, Burton, Lincoln, for **Burton Vic 2nd.**

Class 180B.—*Cows, of any age, breed, or cross, not exceeding 900 lb. live weight.*[1]

1300 **I.** (£15, G. M.,[2] & S. P. £10.[3])—MAJOR TENNANT, St. Anne's Manor, Sutton, Loughborough, for **Daisy** (vol. 16, p. 269), fawn, born March, 1900, in-milk, calved Feb. 22, 1906, bred by T. Beeley, Market Place, Loughborough; *s.* Campboy 8104, *d.* Katherine *by* Halimoden Iron 4166.

1488 **II.** (£10, S. M.,[2] & S. P. £5.[3])—DR. HERBERT WATNEY, Buckhold, Pangbourne, for **Violette** (Jersey) (vol. 15, p. 405), broken colour, born in 1897, calved March 29, 1906, bred by T. J. Vautier, St. Saviour's, Jersey.

1483 **III.** (£5.)—J. H. SMITH-BARRY, Stowell Park, Pewsey, for **Marigold** (Jersey) (vol. 15, p. 338), brown, born June 7, 1901, calved Jan. 2, 1906; *s.* Sportive 7037, *d.* Magenta 5th *by* Dr. Jim 5861.

1479 **R. N. & H. C., & Certificate.**[4]—A. MILLER-HALLETT, Goddington, Chelsfield, for **Salvadora.**

Special Milk Yield Prizes.

Class 181.—*Cows (in-milk), of any age, breed, or cross, judged by points under Regulation 73 of the Prize Sheet.*[1] [33 entries, 3 absent.]

1481 **I.** (£20.)—REUBEN SHELTON, Grange Farm, Ruddington, Nottingham, for **Lady Mainstay** (Shorthorn), roan, born about 1898, calved May 22, 1906, breeder unknown.

900 **II.** (£10.)—JOHN EVENS, Burton, Lincoln, for **Burton 4th** (vol. 10, p. 189), born April 23, 1900, in-milk, calved May 15, 1906; *s.* Longfellow 1605, *d.* Burton *by* Professor 200.

1008 **III.** (£5.)—W. P. VOSPER, Merafield, Plympton, for **Primula 2nd** 3937, born Jan. 31, 1898, in-milk, calved March 1, 1906; *s.* Prince Edward 517, *d.* Primula 829 *by* Prince.

901 **R. N. & H. C.**—JOHN EVENS, Burton, Lincoln, for **Burton Primrose 2nd.**

SHEEP.

Oxford Downs.

Class 182.—*Oxford Down Shearling Rams.* [13 entries, 2 absent.]

1490 **I.** (£10.)—ALBERT BRASSEY, Heythrop Park, Chipping Norton; *s.* Winchendon Heythrop 3555.

1494 **II.** (£5.)—JAMES T. HOBBS, Maisey Hampton, Fairford.

1502 **III.** (£3.)—HUGH W. STILGOE, The Grounds, Adderbury, Banbury; *s.* Masterpiece 4130, *d. by* British Standard 3136.

1498 **IV.** (£2.[5])—JAMES HORLICK, Cowley Manor, Cheltenham.

1501 **R. N. & H. C.**—HUGH W. STILGOE.

Class 183.—*Pens of Three Oxford Down Ram Lambs.* [7 entries, 2 absent.]

1503 **I.** (£10), & 1504 **II.** (£5.)—GEORGE ADAMS, Wadley House, Faringdon.

1506 **III.** (£3), & 1507 **R. N. & H. C.**—JAMES T. HOBBS, Maisey Hampton, Fairford.

1508 **IV.** (£2.[5])—JAMES HORLICK, Cowley Manor, Cheltenham.

Class 184.—*Pens of Three Oxford Down Shearling Ewes, of the same Flock.* [4 entries, 1 absent.]

1511 **I.** (£10), & 1512 **III.** (£3.)—JAMES T. HOBBS, Maisey Hampton, Fairford.

1513 **II.** (£5.)—JAMES HORLICK, Cowley Manor, Cheltenham.

Class 185.—*Pens of Three Oxford Down Ewe Lambs.* [6 entries, none absent.]

1514 **I.** (£10), & 1515 **R. N. & H. C.**—GEORGE ADAMS, Wadley House, Faringdon.

1519 **II.** (£5.)—HUGH W. STILGOE, The Grounds, Adderbury, Banbury; *ss.* Big Bones 4257 and Heythrop 4076.

1518 **III.** (£3.)—JAMES HORLICK, Cowley Manor, Cheltenham.

1517 **IV.** (£2.[5])—JAMES T. HOBBS, Maisey Hampton, Fairford.

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[1] Prizes given by the English Jersey Cattle Society.

[2] Gold, Silver, and Bronze Medals given by the English Jersey Cattle Society for the three Jersey animals entered or eligible for entry in the English Jersey Herd Book, which obtained the greatest number of points in the Butter Tests.

[3] Special Prizes of £20, £10, and £5 given by the English Jersey Cattle Society for the three Cows in Class 180A and 180B obtaining the greatest number of points in the competition.

[4] Certificate of Merit given by the English Jersey Cattle Society for Jersey cows entered or eligible for entry in the English Jersey Herd Book, not being prize winners.

[5] Fourth Prize given by the Oxford Down Sheep Breeders' Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Shropshires.

Class 186.—*Shropshire Two-Shear Rams.*[1] [10 entries, 2 absent.]

1526 **I.** (£8.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1520 **II.** (£4.)—A. S. BERRY, Church Farm, Whittington, Lichfield.
1525 **R. N. & H. C.**—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., for **Holker Esquire.**

Class 187.—*Shropshire Shearling Rams.* [28 entries, 4 absent.]

1538 **I.** (£10.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1548 **II.** (£5.)—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby.
1535 **III.** (£3.)—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs.
1557 **R. N. & H. C.**—MATTHEW WILLIAMS, Whiston Hall, Albrighton.

Class 188.—*Pens of Five Shropshire Shearling Rams, of the Same Flock.*[1] [16 entries, 1 absent.]

1573 **I.** (£15.)—MATTHEW WILLIAMS, Whiston Hall, Albrighton, Wolverhampton.
1560 **II.** (£10.)—T. A. BUTTAR, Corston, Coupar Angus.
1562 **III.** (£5.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1570 **R. N. & H. C.**—EDWARD NOCK, Harrington Hall, Shifnal

Class 189.—*Special Selling (Auction) Shearling Rams.*[1] [20 entries, none absent.]

1538 **I.** (£20), & 1562 **R. N. & H. C.**—SIR RICHARD COOPER, BT, Shenstone Court.
1535 **II.** (£15.)—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs.
1576 **III.** (£10.)—THE DUKE OF SUTHERLAND, K.G., Lilleshall, Newport, Salop.
1560 **IV.** (£5.)—T. A. BUTTAR, Corston, Coupar Angus.

Class 190.—*Pens of Three Shropshire Ram Lambs.* [12 entries, none absent.]

1579 **I.** (£10.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1585 **II.** (£5.)—EDWARD NOCK, Harrington Hall, Shifnal.
1588 **III.** (£3.)—MATTHEW WILLIAMS, Whiston Hall, Albrighton, Wolverhampton.
1583 **R. N. & H. C.**—T. S. MINTON, Montford, Shrewsbury.

Class 191.—*Pens of Three Shropshire Shearling Ewes, of the same Flock* [9 entries, 1 absent.]

1593 **I.** (£10.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1591 **II.** (£5.)—THE RT. HON. VICTOR C. W. CAVENDISH, M.P., Holker Hall, Lancs.
1597 **III.** (£3.)—SIR P. ALBERT MUNTZ, BT., M.P., Dunsmore, Rugby.
1596 **R. N. & H. C.**—THE EXORS. OF THE LATE PHILO L. MILLS, Ruddington Hall, Nottingham.

Class 192.—*Pens of Three Shropshire Ewe Lambs.* [9 entries, none absent.]

1600 **I.** (£10.)—SIR RICHARD COOPER, BT., Shenstone Court, Lichfield.
1601 **II.** (£5.)—SIR WALTER CORBET, BT., Acton Reynold, Shrewsbury.
1605 **III.** (£3.)—EDWARD NOCK, Harrington Hall, Shifnal.
1604 **R. N. & H. C.**—T. S. MINTON, Montford, Shrewsbury:

Southdowns.

Class 193.—*Southdown Two-Shear Rams.*[2] [17 entries, 6 absent.]

1610 **I.** (£10, & **R. N. for Champion.**[3])—C. R. W. ADEANE, Babraham Hall, Cambridge.
1620 **II.** (£5).—THE DUKE OF NORTHUMBERLAND, K.G., Albury Park, Guildford; *s.* Laird 14th, 5477.
1608 **III.** (£3.)—H. M. THE KING, Sandringham.
1615 **R. N. & H. C.**—JEREMIAH COLMAN, Gatton Park, Surrey.

Class 194.—*Southdown Shearling Rams.* [19 entries, 3 absent.]

1625 **I.** (£10, & **Champion.**[3])—H. M. THE KING, Sandringham.
1627 **II.** (£5.)—C. R. W. ADEANE, Babraham Hall, Cambridge.
1636 **III.** (£3.)—THE EXORS. OF THE LATE COL. H. MCCALMONT, Cheveley, Newmarket.
1641 **R. N. & H. C.**—THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood.

Class 195.—*Pens of Three Southdown Shearling Rams, of the same Flock.*[2] [8 entries, 1 absent.]

1645 **I.** (£10), & 1644 **R. N. & H. C.**—C. R. W. ADEANE, Babraham Hall, Cambridge.
1650 **II.** (£5.)—THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood, Chichester.
1647 **III.** (£3.)—JEREMIAH COLMAN, Gatton Park, Surrey.

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[1] Prizes given by the Shropshire Sheep Breeders' Association.
[2] Prizes given by the Southdown Sheep Society.
[3] Champion Gold Medal, value £10 10*s*., given by the Southdown Sheep Society for the best Southdown Ram in Classes 193 and 194.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 196.—*Pens of Three Southdown Ram Lambs.* [10 entries, 3 absent.]

1651 I. (£10.)—H.M. THE KING, Sandringham.
1659 II. (£5.)—THE EXORS. OF THE LATE COL. H. MCCALMONT, Cheveley, Newmarket.
1653 III. (£3.)—C. R. W. ADEANE, Babraham Hall, Cambridge.
1660 R. N. & H. C.—SIR JULIUS WERNHER, BT., Luton Hoo, Luton.

Class 197.—*Pens of Three Southdown Shearling Ewes, of the same Flock.* [8 entries, 2 absent.]

1665 I. (£10, & Medal.[1])—THE DUKE OF DEVONSHIRE, K.G., Compton Place, Eastbourne.
1663 II. (£5.)—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds.
1667 III. (£3.)—THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood, Chichester.
1664 R. N. & H. C.—JEREMIAH COLMAN, Gatton Park, Surrey.

Class 198.—*Pens of Three Southdown Ewe Lambs.* [9 entries, 3 absent.]

1669 I. (£10, & R. N. for Medal.[1])—H.M. THE KING, Sandringham.
1677 II. (£5.)—THE EXORS. OF THE LATE COL. H. MCCALMONT, Cheveley, Newmarket.
1673 III. (£3.)—JEREMIAH COLMAN, Gatton Park, Surrey.
1670 R. N. & H. C.—C. R. W. ADEANE, Babraham Hall, Cambridge.

Hampshire Downs.

Class 199.—*Hampshire Down Two-Shear Rams.*[2] [9 entries, 1 absent.]

1681 I. (£10), & 1682 II. (£5.)—JAMES FLOWER, Chilmark, Salisbury.
1678 R. N. & H. C.—T. FOWELL BUXTON, Waters Place, Ware.

Class 200.—*Hampshire Down Shearling Rams.* [18 entries, 2 absent.]

1694 I. (£10), & 1695 II. (£5.)—JAMES FLOWER, Chilmark, Salisbury.
1701 III. (£3.)—H. C. STEPHENS, Cholderton, Salisbury.
1688 R. N. & H. C.—T. FOWELL BUXTON, Waters Place, Ware.

Class 201.—*Pens of Three Hampshire Down Ram Lambs.* [16 entries, 2 absent.]

1709 I. (£10, & Champion.[3])—JAMES FLOWER, Chilmark, Salisbury.
1706 II. (£5, & R. N. for Champion.[3])—CARY COLES, Manor House, Winterbourne Stoke, Salisbury.
1705 III. (£3.)—T. FOWELL BUXTON, Waters Place, Ware.
1717 R. N. & H. C.—SIR WILLIAM G. PEARCE, BT., Chilton Lodge, Hungerford.

Class 202.—*Pens of Three Hampshire Down Shearling Ewes, of the same Flock.* [No Entry.]

Class 203.—*Pens of Three Hampshire Down Ewe Lambs.* [11 entries, 2 absent.]

1723 I. (£10.)—JAMES FLOWER, Chilmark, Salisbury.
1722 II. (£5.)—CARY COLES, Manor House, Winterbourne Stoke, Salisbury.
1728 III. (£3.)—SIR WILLIAM G. PEARCE, BT., Chilton Lodge, Hungerford.
1729 R. N. & H. C.—H. C. STEPHENS, Cholderton, Salisbury.

Suffolks.

Class 204.—*Suffolk Two-Shear Rams.*[4] [5 entries, 2 absent.]

1732 I. (£10.)—ROBERT BARCLAY, Higham, Bury St. Edmunds, for **Higham 71st** 8607.
1734 II. (£5.)—S. R. SHERWOOD, Playford, Ipswich, for ram, bred by M. G. Hale, Claydon, Suffolk.
1735 III. (£3.)—HERBERT E. SMITH, The Grange, Walton, Suffolk.

Class 205.—*Suffolk Shearling Rams.* [9 entries, 2 absent.]

1744 I. (£10), & 1745 II. (£5.)—HERBERT E. SMITH, The Grange, Walton, Suffolk.
1738 III. (£3.)—ROBERT BARCLAY, Higham, Bury St. Edmunds, for **Higham 73rd**; *s.* Higham 71st 8607.
1742 R. N. & H. C.—S. R. SHERWOOD, Playford, Ipswich.

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[1] Silver Medal given by the Southdown Sheep Society for the best pen of Southdown Ewes or Ewe Lambs in Classes 197 and 198.
[2] Prizes given by the Hampshire Down Sheep Breeders' Association.
[3] Champion Prize of £10 given by the Hampshire Down Sheep Breeders' Association for the best Pen of Ram Lambs or Ewe Lambs in Classes 201 and 203.
[4] Prizes given by the Suffolk Sheep Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 206.—*Suffolk Ram Lambs.*[1] [7 entries, 2 absent.]

1751 **I.** (£10), & 1752 **II.** (£5.)—HERBERT E. SMITH, The Grange, Walton, Suffolk.
1750 **III.** (£3.)—S. R. SHERWOOD, Playford, Ipswich.
1746 **R. N. & H. C.**—ROBERT BARCLAY, Higham, Bury St. Edmunds.

Class 207.—*Pens of Three Suffolk Ram Lambs.* [5 entries, 1 absent.]

1757 **I.** (£10.)—HERBERT E. SMITH, The Grange, Walton, Suffolk.
1756 **II.** (£5.)—S. R. SHERWOOD, Playford, Ipswich.
1754 **III.** (£3.)—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham, S.O. Essex; *s.* Bismarck of Yeldham 2nd 7910.
1753 **R. N. & H. C.**—ROBERT BARCLAY, Higham, Bury St. Edmunds.

Class 208.—*Pens of Three Suffolk Shearling Ewes, of the same Flock.* [3 entries.]

1758 **I.** (£10), & 1759 **II.** (£5.)—ROBERT BARCLAY, Higham, Bury St. Edmunds.
1760 **R. N. & H. C.**—EARL CADOGAN, K.G., Culford Hall, Bury St. Edmunds.

Class 209.—*Pens of Three Suffolk Ewe Lambs.* [5 entries, 1 absent.]

1765 **I.** (£10.)—HERBERT E. SMITH, The Grange, Walton, Suffolk.
1761 **II.** (£5.)—ROBERT BARCLAY, Higham, Bury St. Edmunds.
1764 **III.** (£3.)—S. R. SHERWOOD, Playford, Ipswich.
1762 **R. N. & H. C.**—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham.

Lincolns.

Class 210.—*Lincoln Two-Shear Rams.*[2] [7 entries, 1 absent.]

1770 **I.** (£7, & **R. N. for Champion.**[3])—CHARLES E. HOWARD, Nocton Rise, Lincoln: *s.* Nocton Rise Casswell 7002.
1766 **II.** (£3.)—TOM CASSWELL, Pointon, Folkingham, for **Pointon A1** 9040.
1767 **R. N. & H. C.**—TOM CASSWELL, for **Pointon Eclipse.**

Class 211.—*Lincoln Shearling Rams.* [15 entries, 1 absent.]

1781 **I.** (£10, & **Champion**[3]), & 1782 **III.** (£3.)—HENRY DUDDING, Riby Grove, Great Grimsby.
1786 **II.** (£5.)—R. & W. WRIGHT, Nocton Heath, Lincoln.
1774 **R. N. & H. C.**—TOM CASSWELL, Pointon, Folkingham.

Class 212.—*Pens of Five Lincoln Shearling Rams, of the same Flock.*[2] [11 entries, 1 absent.]

1793 **I.** (£15.)—HENRY DUDDING, Riby Grove, Great Grimsby.
1798 **II.** (£10.)—R. & W. WRIGHT, Nocton Heath, Lincoln.
1791 **III.** (£5.)—S. E. DEAN & SONS, Dowsby Hall, Bourne.
1790 **R. N. & H. C.**—TOM CASSWELL, Pointon, Folkingham.

Class 213.—*Pens of Three Lincoln Ram Lambs.* [8 entries, 1 absent.]

1805 **I.** (£10.)—R. & W. WRIGHT, Nocton Heath, Lincoln.
1803 **II.** (£5.)—CHARLES E. HOWARD, Nocton Rise, Lincoln.
1801 **III.** (£3), & 1802 **R. N. & H. C.**—HENRY DUDDING, Riby Grove, Great Grimsby.

Class 214.—*Pens of Three Lincoln Shearling Ewes, of the same Flock.* [7 entries, none absent.]

1810 **I.** (£10.)—HENRY DUDDING, Riby Grove, Great Grimsby.
1813 **II.** (£5.)—R. & W. WRIGHT, Nocton Heath, Lincoln.
1807 **III.** (£3.)—TOM CASSWELL, Pointon, Folkingham.
1808 **R. N. & H. C.**—S. E. DEAN & SONS, Dowsby Hall, Bourne.

Class 215.—*Pens of Three Lincoln Ewe Lambs.* [6 entries, none absent.]

1819 **I.** (£10.)—R. & W. WRIGHT, Nocton Heath, Lincoln.
1817 **II.** (£5.)—CHARLES E. HOWARD, Nocton Rise, Lincoln.
1816 **III.** (£3.)—HENRY DUDDING, Riby Grove, Great Grimsby.
1814 **R. N. & H. C.**—S. E. DEAN & SONS, Dowsby Hall, Bourne.

Leicesters.

Class 216.—*Leicester Shearling Rams.* [9 entries, none absent.]

1824 **I.** (£10), & 1825 **III.** (£3.)—E. F. JORDAN, Eastburn, Driffield.
1821 **II.** (£5), & 1822 **R. N. & H. C.**—GEORGE HARRISON, Gainford Hall, Darlington.

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[1] Prizes given by the Suffolk Sheep Society.
[2] Prizes given by the Lincoln Long-wool Sheep Breeders' Association.
[3] Champion Medal, value £5 5*s*., given by the Lincoln Long-wool Sheep Breeders' Association for the best Lincoln Ram in Classes 210 and 211.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 217.—*Pens of Three Leicester Ram Lambs.* [6 entries, none absent.]

1829 **I.** (£10.)—GEORGE HARRISON, Gainford Hall, Darlington.
1831 **II.** (£5), & 1832 **III.** (£3.)—E. F. JORDAN, Eastburn, Driffield.
1834 **R. N. & H. C.**—J. E. & C. H. SIMPSON, Pilmoor House, Hunmanby.

Class 218.—*Pens of Three Leicester Shearling Ewes, of the same Flock.* [6 entries, none absent.]

1838 **I.** (£10), & 1839 **II.** (£5.)—E. F. JORDAN, Eastburn, Driffield.
1836 **III.** (£3), & 1837 **R. N. & H. C.**—GEORGE HARRISON, Gainford Hall, Darlington.

Class 219.—*Pens of Three Leicester Ewe Lambs.* [6 entries, none absent.]

1841 **I.** (£10), & 1842 **III.** (£3.)—GEORGE HARRISON, Gainford Hall, Darlington.
1843 **II.** (£5), & 1844 **R. N. & H. C.**—E. F. JORDAN, Eastburn, Driffield.

Cotswolds.

Class 220.—*Cotswold Shearling Rams.* [6 entries, none absent.]

1847 **I.** (£7), & 1848 **R. N. & H. C.**—W. T. GARNE, Aldsworth, Northleach.
1849 **II.** (£3.)—WILLIAM HOULTON, Broadfield Farm, Northleach.

Class 221.—*Pens of Three Cotswold Ram Lambs.*[1] [3 entries, 1 absent.]

1853 **I.** (£7), & 1854 **II.** (£3.)—W. T. GARNE, Aldsworth, Northleach.

Class 222.—*Pens of Three Cotswold Shearling Ewes, of the same Flock.* [3 entries.]

1856 **I.** (£7), & 1857 **R. N. & H. C.**—W. T. GARNE, Aldsworth, Northleach.
1858 **II.** (£3.)—WILLIAM HOULTON, Broadfield Farm, Northleach.

Class 223.—*Pens of Three Cotswold Ewe Lambs.*[1] [3 entries, 1 absent.]

1859 **I.** (£7), & 1860 **II.** (£3.)—W. T. GARNE, Aldsworth, Northleach.

Border Leicesters.

Class 224.—*Border Leicester Shearling Rams.* [6 entries, none absent.]

1862 **I.** (£10), & 1863 **R. N. & H. C.**—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk.
1864 **II.** (£5.)—JOSEPH JAMES, Aughterside Mill, Bullgill, Cumberland.
1866 **III.** (£3.)—THOMAS WINTER, Lotherton Park, Aberford, Leeds.

Class 225.—*Pens of Three Border Leicester Ram Lambs.* [3 entries.]

1868 **I.** (£10.)—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk.
1869 **II.** (£5.)—JOSEPH JAMES, Aughterside Mill, Bullgill, Cumberland.
1870 **III.** (£3.)—THOMAS WINTER, Lotherton Park, Aberford, Leeds.

Class 226.—*Pens of Three Border Leicester Shearling Ewes, of the same Flock.* [2 entries.]

1872 **I.** (£10.)—THOMAS WINTER, Lotherton Park, Aberford, Leeds.
1871 **II.** (£5.)—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk.

Class 227.—*Pens of Three Border Leicester Ewe Lambs.* [3 entries.]

1873 **I.** (£10.)—THE RT. HON. A. J. BALFOUR, M.P., Whittingehame, Prestonkirk.
1874 **II.** (£5.)—JOSEPH JAMES, Aughterside Mill, Bullgill, Cumberland.
1875 **III.** (£3.)—THOMAS WINTER, Lotherton Park, Aberford, Leeds.

Kent or Romney Marsh.

Class 228.—*Kent or Romney Marsh Two-Shear Rams.*[2] [10 entries, 2 absent.]

1876 **I.** (£10.)—CHARLES FILE, Elham, Canterbury, for **Elham No. 58 of 1904.**
1879 **II.** (£5.)—WILLIAM MILLEN, Syndale Valley, Faversham.
1884 **III.** (£3.)—HENRY RIGDEN, Etchinghill, Lyminge, S.O., Kent, for **60 of 1904.**
1885 **R. N. & H. C.**—HENRY RIGDEN, for **70 of 1904.**

Class 229.—*Kent or Romney Marsh Shearling Rams.* [21 entries, 1 absent.

1891 **I.** (£10), & 1890 **R. N. & H. C.**—CHARLES FILE, Elham, Canterbury.
1900 **II.** (£5.)—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
1901 **III.** (£3.)—HENRY RIGDEN, Etchinghill, Lyminge, S.O., Kent.

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[1] Prizes given by the Cotswold Sheep Society.
[2] Prizes given by the Kent or Romney Marsh Sheep Breeders' Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 230.—*Pens of Three Kent or Romney Marsh Ram Lambs.* [13 entries, 1 absent.]

1912 **I.** (£10.)—WILLIAM MILLEN, Syndale Valley, Faversham.
1914 **II.** (£5.)—J. B. PALMER, New Shelve Manor, Lenham, Maidstone; *s.* Jumbo 48th.
1916 **III.** (£3.)—J. EGERTON QUESTED, The Firs, Cheriton, Kent.
1919 **R. N. & H. C.**—THE EARL OF VERULAM, Gorhambury, St. Albans.

Class 231.—*Pens of Three Kent or Romney Marsh Shearling Ewes, of the same Flock.* [8 entries, none absent.]

1924 **I.** (£10), & 1923 **III.** (£3.)—WILLIAM MILLEN, Syndale Valley, Faversham.
1925 **II.** (£5.)—FREDERICK NEAME, Macknade, Faversham.
1922 **R. N. & H. C.**—CHARLES FILE, Elham, Canterbury.

Class 232.—*Pens of Three Kent or Romney Marsh Ewe Lambs.* [12 entries, 1 absent.]

1933 **I.** (£10.)—WILLIAM MILLEN, Syndale Valley, Faversham.
1934 **II.** (£5.)—FREDERICK NEAME, Macknade, Faversham.
1938 **III.** (£3.)—HENRY RIGDEN, Etchinghill, Lyminge, S.O., Kent.
1935 **R. N. & H. C.**—JOHN B. PALMER, New Shelve Manor, Lenham, Maidstone.

Wensleydales.

Class 233.—*Wensleydale Shearling Rams.* [3 entries.]

1940 **I.** (£10.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, S.O., Yorks.; *s.* Royal Heir 980, *d. by* Estimation 487.
1941 **II.** (£5.)—THE EXORS. OF THE LATE T. WILLIS; *s.* Royal Prince 981, *d. by* Royal Hero 821.
1942 **III.** (£3.)—THE EXORS. OF THE LATE T. WILLIS; *s.* Royal Prince 981, *d. by* Royal York 658.

Class 234.—*Pens of Three Wensleydale Ram Lambs.* [3 entries.]

1945 **I.** (£10.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, S.O. Yorks.; *s.* Royal Heir 980.
1943 **II.** (£5.)—EDWARD HORSEMAN, Broken Briar Farm, Richmond, Yorks.; *s.* Park Royal 961, *ds. by* District Councillor 865 and Leyburn Double First 834.
1944 **III.** (£3.)—RICHARD STUART, Brook Vale, Sowerby, Garstang.

Class 235.—*Pens of Three Wensleydale Shearling Ewes, of the same Flock.* [2 entries.]

1947 **I.** (£10.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, S.O. Yorks.; *ss.* Royal Prince 981 and William 4th 842.
1946 **II.** (£5.)—EDWARD HORSEMAN, Broken Briar Farm, Richmond, Yorks.; *s.* Park Royal 961, *ds. by* District Councillor 865 and Leyburn Double First 834.

Class 236.—*Pens of Three Wensleydale Ewe Lambs.* [3 entries.]

1950 **I.** (£10.)—THE EXORS OF THE LATE T. WILLIS, Manor House, Carperby, S.O., Yorks.; *s.* Royal Heir 980.
1948 **II.** (£5.)—EDWARD HORSEMAN, Broken Briar Farm, Richmond, Yorks.; *s.* Park Royal 961, *ds.* by District Councillor 865 and Leyburn Double First 834.
1949 **III.** (£3.)—RICHARD STUART, Brook Vale, Sowerby, Garstang; *s.* Tor King, *d. by* Creditor 789.

Dorset Horn.

Class 237.—*Dorset Horn Shearling Rams, dropped after November* 1, 1904. [7 entries, 1 absent.]

1952 **I.** (£10.)—W. R. FLOWER, West Stafford, Dorchester, for **Flower's No. 114** 1694; *s.* Romulus 1635, *d. by* Nynehead No. 10 1202.
1953 **II.** (£5.)—W. R. FLOWER, for **Flower's No. 115** 1695; *s.* Romulus 1635, *d. by* Nynehead No. 10 1202.
1954 **III.** (£3.)—W. R. FLOWER, for **Flower's No. 120** 1700; *s.* Flower's No 101 1440, *d. by* Nynehead No. 10 1202.
1955 **R. N. & H. C.**—E. A. HAMBRO, Milton Abbey, Blandford, for **Delcombe No. 19.**

Class 238.—*Pens of Three Dorset Horn Ram Lambs, dropped after November* 1, 1905. [5 entries, 1 absent.]

1958 **I.** (£10, & **Champion.**[1])—JAMES ATTRILL, Waytes Court, Brighstone, Isle of Wight.
1959 **II.** (£5.)—W. R. FLOWER, West Stafford, Dorchester, for **Flower's Nos. 141, 142, and** 143; *s.* Petherton Lad 1798. *d. by* Flower's No. 101 1440.
1960 **III.** (£3.)—E. A. HAMBRO, Milton Abbey, Blandford; *s.* Delcombe No. 20 1803.
1962 **R. N. & H. C.**—FRANK J. MERSON, Farringdon, North Petherton, Bridgwater.

[1] Champion Prize of £10 given by the Dorset Horn Sheep Breeders' Association for the best Pen of Ram Lambs, Shearling Ewes or Ewe Lambs in Classes 238-240.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 239.—*Pens of Three Dorset Horn Shearling Ewes, of the same Flock, dropped after November* 1, 1904. [5 entries, none absent.]

1963 **I.** (£10, & **R. N. for Champion**[1]), & 1964 **III.** (£3.)—W. R. FLOWER, West Stafford, Dorchester : *s.* Flower's No. 101 1440. *d. by* Nynehead No. 10 1202.
1965 **II.** (£5.)—E. A. HAMBRO, Milton Abbey, Blandford ; *s.* Delcombe No. 11 1642.
1966 **R. N. & H. C.**—E. A. HAMBRO.

Class 240.—*Pens of Three Dorset Horn Ewe Lambs, dropped after November* 1, 1905. [5 entries, none absent.]

1968 **I.** (£10.)—JAMES ATTRILL, Waytes Court, Brighstone, Isle of Wight.
1969 **II.** (£5.)—W. R. FLOWER, West Stafford, Dorchester ; *s.* Romulus 1635, *d. by* Flower's No. 101 1440.
1971 **III.** (£3), & 1970 **R. N. & H. C.**—E. A. HAMBRO, Milton Abbey, Blandford ; *s.* Delcombe No. 20 1803.

Devon Long Wool.

Class 241.—*Devon Long Wool Shearling Rams.* [4 entries.]

1974 **I.** (£7), 1975 **II.** (£3), & 1976 **R. N. & H. C.**—FREDERICK WHITE, Torweston, Williton, Somerset.
1973 **III.** (£2.[2])—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset.

Class 242.—*Pens of Two Devon Long Wool Ram Lambs.*[3] [3 entries.]

1978 **I.** (£7), & 1979 **R. N. & H. C.**—FREDERICK WHITE, Torweston, Williton, Somerset.
1977 **II.** (£3.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard, Somerset.

Class 243.—*Pens of Three Devon Long Wool Shearling Ewes, of the same Flock.* [3 entries.]

1981 **I.** (£7), 1980 **II.** (£3), & 1982 **R. N. & H. C.**—FREDERICK WHITE, Torweston, Williton, Somerset.

South Devons.

Class 244.—*South Devon Rams, Shearling and upwards.* [4 entries, none absent.]

1986 **I.** (£7.)—JOHN STOOKE, Sherford, Brixton, Plymouth, for ram, born Feb. 14, 1904, bred by J. S. Hallett, Sherford, Brixton, Plymouth.
1983 **II.** (£3.)—JOHN S. HALLETT, Sherford, Brixton, Plymouth, for **Sherford**, born Feb., 1905 ; *s.* Brent Winner 2nd.

Class 245.—*Pens of Three South Devon Shearling Ewes, of the same Flock.* [2 entries.]

1987 **I.** (£7.)—JOHN S. HALLETT, Sherford, Brixton, Plymouth ; *s.* Brent Winner 2nd.
1988 **II.** (£3.)—JOHN STOOKE, Sherford, Brixton, Plymouth.

Dartmoors.

Class 246.—*Dartmoor Rams, Shearling and upwards.* [2 entries.]

1989 **I.** (£7.)—JOHN R. T. KINGWELL, Great Aish, South Brent, Devon, for ram, born March, 1903, bred by Messrs. Toope, Place Barton, Tavistock.
1990 **II.** (£3.)—JOHN R. T. KINGWELL, for ram, born March, 1905 ; *s.* Massive.

Class 247.—*Pens of Three Dartmoor Shearling Ewes, of the same Flock.* [2 entries.]

1992 **I.** (£7), & 1991 **II.** (£3.)—JOHN R. T. KINGWELL, Great Aish, South Brent, Devon.

Exmoors.

Class 248.—*Exmoor Rams, Shearling and upwards.* [2 entries.]

1993 **I.** (£7.)—CHARLES N. SKINNER, Shortlands, Kent, for ram, born April 11, 1904.
1994 **II.** (£3.)—CHARLES N. SKINNER, for ram, born April 15, 1905.

Class 249.—*Pens of Three Exmoor Shearling Ewes, of the same Flock.* [2 entries.]

1995 **I.** (£7), & 1996 **II.** (£3.)—CHARLES N. SKINNER, Shortlands, Kent.

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[1] Champion Prize of £10 given by the Dorset Horn Sheep Breeders' Association for the best Pen of Ram Lambs, Shearling Ewes or Ewe Lambs in Classes 238-240.
[2] Third Prize given by the Devon Long-woolled Sheep Breeders' Society.
[3] Prizes given by the Devon Long-woolled Sheep Breeders' Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Cheviots.

Class 250.—*Cheviot Rams, Shearling and upwards.* [3 entries.]

1997 **I.** (£7.)—JACOB ROBSON, Byrness, Otterburn, for **Lanercost,** born April, 1903, bred by John Elliot, Hindhope, Jedburgh : *s.* Prince of Wales 1303.
1999 **II.** (£3.)—JOHN ROBSON, Newton, Bellingham, for ram, born in 1905.
1998 **R. N. & H. C.**—JACOB ROBSON, for **Sprightly Boy.**

Class 251.—*Pens of Three Cheviot Shearling Ewes, of the same Flock.* [3 entries.]

2000 **I.** (£7), & 2001 **R. N. & H. C.**—JACOB ROBSON, Byrness, Otterburn.
2002 **II.** (£3.)—JOHN ROBSON, Newton, Bellingham.

Black-faced Mountain.

Class 252.—*Black-faced Mountain Rams, Shearling and upwards.* [7 entries, none absent.]

2003 **I.** (£10.)—JOHN DARGUE, Burneside Hall, Kendal, for ram, born April 21, 1904.
2008 **II.** (£3.[1])—JOHN ROBSON, JUN., Lynegar, Watten, Caithness, for ram, born in 1904, bred by A. F. Fraser, Rankinston, Ayr.
2005 **III.** (£2.[1])—JOHN DOWSON. Danby Castle, Grosmont, York, for ram, bred by S. Boocock, Moorsholm, Guisborough.
2007 **R. N. & H. C.**—JOHN ROBSON, Newton, Bellingham.

Class 253.—*Pens of Three Black-faced Mountain Shearling Ewes, of the same Flock.* [5 entries, none absent.]

2012 **I.** (£10.)—JOHN ROBSON, Newton, Bellingham.
2013 **II.** (£3.[1])—JOHN ROBSON, JUN., Lynegar, Watten, Caithness, for ewes, bred by John Robson, Newton, Bellingham.
2010 **III.** (£2.[1])—JOHN DARGUE, Burneside Hall, Kendal.
2011 **R. N. & H. C.**—JOHN DOWSON, Danby Castle, Grosmont, York.

Lonks.

Class 254.—*Lonk Rams, Shearling and upwards.* [3 entries, 1 absent.]

2016 **I.** (£10.)—DAVID HAGUE, Copy Nook, Bolton-by-Bowland, Yorks., for **Worsthorne Wonder** 64, born April 24, 1904, bred by F. Ormerod, Worsthorne, Burnley.
2015 **II.** (£5.[2])—JOHN BLACKBURN, Eddisford Bridge Hotel, Clitheroe, for **Perfection 2nd** 45, born April 3, 1905 ; *s.* Perfection 44, *d.* Mountain Girl *by* Old Perfect.

Class 255.—*Pens of Three Lonk Shearling Ewes, of the same Flock.* [2 entries.]

2019 **I.** (£10.)—DAVID HAGUE, Copy Nook, Bolton-by-Bowland, Yorks. ; *s.* Worsthorne Wonder 64.
2018 **II.** (£5.[2])—JOHN BLACKBURN, Eddisford Bridge Hotel, Clitheroe ; *s.* Perfection 44.

Herdwicks.

Class 256.—*Herdwick Rams, Shearling and upwards.* [3 entries.]

2021 **I.** (£7.)—W. J. CROSSLEY, M.P., Pullwoods, Ambleside, for **Kingmoor 4th,** born May 6, 1905 : *s.* Kingmoor 3rd, *d.* Park Royal *by* Cardiff Hero.
2020 **II.** (£3.)—W. J. CROSSLEY, M.P., for **Kingmoor 3rd,** born April 15, 1904, bred by T. N. Clark, Pullwoods, Ambleside ; *s.* Blomer, *d.* Ladymoor *by* Royal Prince.
2022 **R. N. & H. C.**—JAMES TODD, Rougholme, Waberthwaite, for **Bouncing Boy.**

Class 257.—*Pens of Three Herdwick Shearling Ewes, of the same Flock.* [2 entries.]

2023 **I.** (£7.)—W. J. CROSSLEY, M.P., Pullwoods, Ambleside, for **Paddis 2nd, Princess May** and **Blue Bell** ; *s.* Kingmoor 3rd, *ds.* Paddis and Creamy *by* Bouncer.
2024 **II.** (£3.)—JAMES TODD, Rougholme, Waberthwaite, Cumberland.

Welsh Mountain.

Class 258.—*Welsh Mountain Rams, Shearling and upwards.* [7 entries, none absent.]

2028 **I.** (£10.)—OWEN PRICE, Nantyrharn, Cray, for **Twm o'r Nant 2nd,** born March 7, 1903 ; *s.* Twm o'r Nant, *d.* Sian *by* Dafydd.
2030 **II.** (£5.)—THE UNIVERSITY COLLEGE OF NORTH WALES, Madryn, Aber, Bangor, for **Madryn Voryd,** born March, 1905, bred by J. Ll. Gratton, Voryd Farm, Abergele; *s.* Hero.

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[1] Second and Third Prizes given by the Black-faced Sheep Breeders' Association.
[2] Second Prize given by the Lonk Sheep Breeders' Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

2029 **III.** (£3.)—THE UNIVERSITY COLLEGE OF NORTH WALES, for **Madryn Chief,** born March 3, 1902, bred by J. Ll. Gratton, Voryd Farm, Abergele; *s.* Old Brynmelyn Chief.

2025 **R. N. & H. C.**—J. MARSHALL DUGDALE, Llwyn, Llanfyllin, for **Yspottyn Ddu.**

Class 259.—*Pens of Three Welsh Mountain Shearling Ewes, of the same Flock.* [9 entries, none absent.]

2033 **I.** (£10.)—OWEN PRICE, Nantyrharn, Cray, for **Sian, Gwen, and Peggy**; *ss.* Twm o'r Nant and Twm o'r Nant 2nd.

2039 **II.** (£5.)—THE UNIVERSITY COLLEGE OF NORTH WALES, Madryn, Aber, Bangor: *s.* Madryn Taffy.

2032 **III.** (£3.)—J. MARSHALL DUGDALE, Llwyn, Llanfyllin.

2036 **R. N. & H. C.**—HENRY O. ELLIS, Tynhendre, Bangor.

Ryeland.

Class 259a.—*Ryeland Rams, Two-shear and upwards.*[1] [3 entries.]

2041 **I.** (£10.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard, for **Duplicate,** born March, 1903; *s.* Bo Peep, *d. by* Slowcoach.

2043 **II.** (£5.)—W. H. DAVIES, Claston, Dormington, Herefordshire.

2042 **R. N. & H. C.**—W. H. DAVIES, for **Sure Winner.**

Class 260.—*Ryeland Shearling Rams.* [5 entries, none absent.]

2044 **I.** (£10), & 2045 **II.** (£5.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard.

2048 **III.** (£3.)—F. E. GOUGH, The Moor, Bodenham, Leominster; *s.* Moorland Chief 10 *d. by* Bodenham Wonder.

2047 **R. N. & H. C.**—W. H. DAVIES, Claston, Dormington, Herefordshire.

Class 261.—*Pens of Three Ryeland Shearling Ewes, of the same Flock.* [5 entries, none absent.]

2049 **I.** (£10), & 2050 **II.** (£5.)—W. T. BARNEBY, Saltmarshe Castle, Bromyard.

2052 **III.** (£3.)—W. H. DAVIES, Claston, Dormington, Herefordshire.

2053 **R. N. & H. C.**—F. E. GOUGH, The Moor, Bodenham, Leominster.

PIGS.

Large White Breed.[2]

Class 262.—*Large White Boars, farrowed in* 1904 *or* 1905. [14 entries, 2 absent.]

2058 **I.** (£10.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton Tartar** 9319, born April 6, 1904, bred by W. Hall, Hollinhurst Head, New Mills; *s.* Walton Albert 5th 7993, *d.* Bottesford Queen 33rd 12318 *by* Borrowfield Long Sam 2nd.

2065 **II.** (£5.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for **Holywell Happy,** born Aug. 28, 1904; *s.* Holywell Sowerby 7775, *d.* Holywell Day Girl 15794 *by* Holywell John Day 6409.

2067 **III.** (£3.)—C. J. TONG, Great Towbrick Farm, Hambleton, Poulton-le-Fylde, for **Shard Roger** 8725, born Jan. 22, 1904; *s.* Roger 7203, *d.* Shard Floss 4th 12938 *by* Shard Sam 5641.

2056 **R. N. & H. C.**—SIR GILBERT GREENALL, BT., for **Walton King 4th.**

Class 263.—*Pens of Three Large White Boar Pigs, farrowed in* 1906. [11 entries, 2 absent.]

2069 **I.** (£10.)—D. R. DAYBELL, Bottesford, Nottingham, for pen, born Jan. 4; *s.* Bottesford Arthur 8487, *d.* Bottesford Queen 12th 10150 *by* Bottesford Rufford 3903.

2073 **II.** (£5.)—THOMAS HENSON, Eastgate, Peterborough, for pen, born Jan. 20, bred by W. E. Measures, Tallington, Stamford: *s.* Ruddington Rightstamp 8717, *d.* Peterboro' Carnation 16014 *by* Shitterton Turk 7937.

2077 **III.** (£3.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for pen, born Jan. 11; *s.* Holywell Genius 9169, *d.* Holywell Empress E. *by* Holywell Hubert 7089.

2076 **R. N. & H. C.**—R. R. ROTHWELL, Fulwood Hall Farm, Preston.

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[1] Prizes given by the Ryeland Flock Book Society.

[2] The sum of £35 towards these Prizes was given by the National Pig Breeders' Association.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 264.—*Large White Breeding Sows, farrowed in* 1902, 1903, *or* 1904. [14 entries, 3 absent.]

2081 **I. (£10, & Champion.**[1])—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Lindsey A** 14183, born July 17, 1902, farrowed April 4, 1906, bred by C. E. Duckering, The Cliff, Kirton-in-Lindsey ; *s.* Scarsdale Jerry 6571, *d.* Sister to Lindsey Queen 4th 11472 *by* Lindsey Cultivator 1st 5575.

2085 **II. (£5, & R. N. for Champion.**[1])—R. M. KNOWLES, Colston Bassett Hall, Bingham, for **Colston Lass 13th** 15562, born Jan. 5, 1904, farrowed May 24, 1906 ; *s.* Vanguard 7261, *d.* Colston Lass 11216 *by* Ruddington King David 5th 3143.

2082 **III.** (£3.)—SIR GILBERT GREENALL, BT., for **Walton Ivy** 14724, born July 6, 1902, farrowed Jan. 16, 1906 ; *s.* Pride of Erin 6533, *d.* Sowerby Duchess 2nd 10580 *by* Sowerby Samson 5643.

2090 **R. N. & H. C.**—SANDERS SPENCER & SON, for **Holywell Empress E.**

Class 265.—*Large White Sows, farrowed in* 1905. [13 entries, none absent.]

2103 **I.** (£10.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for **Holywell A1,** born Jan. 10 ; *s.* Holywell Daily Mail 8609, *d.* Holywell Golden Czarina *by* Holywell Golden Lion 7085.

2104 **II.** (£5.)—SANDERS SPENCER & SON, for **Holywell Empress Derby,** born Jan. 12 ; *s.* Holywell John Day 6409, *d.* Holywell Empress D 15796 *by* Holywell Emperor 6399.

2095 **III.** (£3.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton Nell 16th** 17542, born Jan. 5 ; *s.* Walton Albert 4th 7991, *d.* Walton Nell 4th 11728 *by* Walton Regent 5659.

2098 **R. N. & H. C.**—R. M. KNOWLES, Colston Bassett, Bingham, for **Colston Lassie 13th.**

Class 266.—*Pens of Three Large White Sow Pigs, farrowed in* 1906. [14 entries, 1 absent.]

2109 **I.** (£10.)—D. R. DAYBELL, Bottesford, Nottingham, for pen, born Jan. 4 ; *s.* Bottesford Merit 3rd 9009, *d.* Bottesford Empress 3rd 16714 *by* Borrowfield Ringleader 20th.

2108 **II.** (£5.)—D. R. DAYBELL, for pen, born Jan. 4 ; *s.* Bottesford Arthur 8487, *d.* Bottesford Queen 12th 10150 *by* Bottesford Rufford 3903.

2113 **III.** (£3.)—THOMAS HENSON, Eastgate, Peterborough, for pen, born Jan. 2, bred by T. Simpson Jay, Warren Farm, Wimbledon ; *s.* Holywell Warren 8625, *d.* Warren Starlight 16204 *by* Warren Eclipse 8793.

2107 **R. N. & H. C.**—D. R. DAYBELL.

Middle White Breed.[2]

Class 267.—*Middle White Boars, farrowed in* 1904 *or* 1905. [7 entries, none absent.]

2125 **I. (£10, & R. N. for Champion.**[3])—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for **Holywell Royal Viscount,** born March 27, 1904 ; *s.* Holywell Viscount 8179, *d.* Holywell Royal Jubilee *by* Holywell Rosador 2nd 6139.

2122 **II.** (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton John 6th** 8891, born Aug. 23, 1904 ; *s.* Offley John 7395, *d.* Walton Pattie 3rd 15132 *by* Rufford Mayor 5309.

2121 **III.** (£3.)—SIR GILBERT GREENALL, BT., for **Walton John 5th** 8889, born Aug. 23, 1904 ; *s.* Offley John 7395, *d.* Walton Pattie 3rd 15132 *by* Rufford Mayor 5309.

2123 **R. N. & H. C.**—SIR GILBERT GREENALL, BT., for **Walton Rufus 2nd.**

Class 268.—*Pens of Three Middle White Boar Pigs, farrowed in* 1906. [4 entries, 1 absent.]

2127 **I.** (£10.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for pen, born Jan. 29 ; *s.* Walton Dainty 3rd 8201, *d.* Walton Pattie 4th 16342 *by* Hardwick Albert.

2129 **II.** (£5.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for pen, born Jan. 2nd, bred by T. Simpson Jay, Warren Farm, Wimbledon ; *s.* Holywell Manchester 8855, *d.* Holywell Vic Countess 13294 *by* Holywell Count Curly 5713.

2128 **III.** (£3.)—SIR GILBERT GREENALL, BT., for pen, born Feb. 10 ; *s.* Offley John 7395, *d.* Walton Rose 22nd 15142 *by* Walton Dainty 6753.

Class 269.—*Middle White Breeding Sows, farrowed in* 1902, 1903, *or* 1904. [8 entries, 2 absent.]

2136 **I. (£10, & Champion.**[3])—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for **Holywell Victoria Duchess,** born April 2, 1903, farrowed Jan. 10, 1906 ; *s.* Castlecroft Dictator 6111, *d.* Holywell Victoria Countess 13298 *by* Holywell Count 3239.

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[1] Champion Gold Medal, value £5 5*s.*, given by the National Pig Breeders' Association for the best Large White Boar or Sow in Classes 262, 264, and 265.

[2] The sum of £35 towards these Prizes was given by the National Pig Breeders' Association.

[3] Champion Gold Medal, value £5 5*s.*, given by the National Pig Breeders' Association for the best Middle White Boar or Sow in Classes 267, 269, and 270.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

2133 **II.** (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton Rose 22nd** 15142, born Dec. 3, 1902, farrowed Feb. 10, 1906 ; *s.* Walton Dainty 6753, *d.* Walton Rose 20th 15138 *by* Walton John 6755.

2134 **III.** (£3.)—LEOPOLD C. PAGET, Harewood, Leeds, for **Holywell Barbara** 16320, born Jan. 1, 1903, farrowed Feb. 24, 1906, bred by Sanders Spencer, Holywell Manor, St. Ives ; *s.* Holywell Middleton 8169, *d.* Holywell Curly Rose 2nd *by* Holywell Count Curly 5713.

2135 **R. N. & H. C.**—LEOPOLD C. PAGET, for **Wharfedale Rosamund.**

Class 270.—*Middle White Sows, farrowed in* 1905. [8 entries, none absent.]

2143 **I.** (£10.)—LEOPOLD C. PAGET, Harewood, Leeds, for **Warren Royal Countess** 17802, born Jan. 11, bred by T. Simpson Jay, The Warren, Wimbledon ; *s.* Holywell Manchester 8855, *d.* Holywell Vic Countess 13294 *by* Holywell Count Curly 5713.

2141 **II.** (£5.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for **Walton Rose 47th** 17776, born March 10, bred by The Leeds Industrial Co-operative Society, Limited, Cow Close Farm, Farnley ; *s.* Ryecroft Maisemore 2nd 9423, *d.* Walton Rose 23rd 15144 *by* Walton Dainty 6753.

2144 **III.** (£3.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for **Holywell Judy,** born Jan. 8 ; *s.* Holywell Viscount 8179, *d.* Holywell Royal Jubilee *by* Holywell Rosador 2nd 6139.

2142 **R. N. & H. C.**—SIR GILBERT GREENALL, BT., for **Walton Rosetta.**

Class 271.—*Pens of Three Middle White Sow Pigs, farrowed in* 1906. [6 entries, none absent.]

2148 **I.** (£10.)—SIR GILBERT GREENALL, BT., Walton Hall, Warrington, for pen, born Feb. 10 ; *s.* Offley John 7395, *d.* Walton Rose 22nd 15142 *by* Walton Dainty 6753.

2151 **II.** (£5.)—SANDERS SPENCER & SON, Holywell Manor, St. Ives, for pen, born Jan. 2 and 16 ; *ss.* Holywell Viscount 8179 and Holywell Rosario 8857, *ds.* Holywell Rosadora 2nd 6139 *by* Castlecroft Dictator 6111 and Holywell Victoria Countess 13298 *by* Holywell Count 3239.

2150 **III.** (£3.)—LEOPOLD C. PAGET, Harewood, Leeds, for pen, born Jan. 1 and 2, bred by T. Simpson Jay, The Warren, Wimbledon ; *ss.* Warren Royalist 9461 and Holywell Manchester 8855, *ds.* Warren Rosy 16374, *by* Sherborne Baron 7409 and Holywell Vic Countess 13294 *by* Holywell Count Curly 5713.

2149 **R. N. & H. C.**—LEOPOLD C. PAGET.

Berkshire Breed.[1]

Class 272.—*Berkshire Boars, farrowed in* 1904 *or* 1905. [14 entries, none absent.]

2157 **I.** (£10.)—R. W. HUDSON, Danesfield, Marlow, for **Okeford Emperor** 10779, born July 17, 1904, bred by the Hon. Claude B. Portman, Child Okeford, Blandford ; *s.* Okeford Rock 10086, *d.* Manor Empress Queen 8660 *by* First Rank F. 7422.

2153 **II.** (£5.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Polegate Dictator** 10388, born July 6, 1904 ; *s.* Cecil Augustus 7756, *d.* Polegate Delightful Lady 9152 *by* Baron Kitchener 8403.

2163 **III.** (£3.)—E. J. MORANT, Heathy Dilton, Boldre, Lymington, for boar, born Jan. 2, 1905, bred by Julius A. Fricker, Burton, Mere, Wilts. ; *s.* Hightide F. B. 9373, *d.* Gillingham L. 9077 *by* Faithful Commons 6640.

2158 **R. N. & H. C.**—G. T. INMAN, Highmoor Hall, Henley, for **Highmoor Belzac.**

Class 273.—*Pens of Three Berkshire Boar Pigs, farrowed in* 1906. [17 entries, none absent.]

2175 **I.** (£10.)—R. W. HUDSON, Danesfield, Marlow, for pen, born Jan. 2 ; *s.* Danesfield McKinley 10365, *d.* Danesfield Sylvia 10352 *by* Danesfield Persimmon 9455.

2169 **II.** (£5.)—G. J. B. CHETWYND, Wyndthorpe, Doncaster, for pen, born Jan. 8 and 14 ; *s.* Don Confidence 10987, *ds.* Don Constancy 10989 and Don Curiosity 10988.

2172 **III.** (£3.)—JULIUS A. FRICKER, Burton, Mere, Wilts., for pen, born Jan. 14 ; *s.* Kohinoor F.B. 10627, *d.* Longform F. 8378 *by* Faithful Commons 6640.

2167 **R. N. & H. C.**—LORD CALTHORPE, Elvetham Park, Winchfield.

Class 274.—*Berkshire Breeding Sows, farrowed in* 1902, 1903, *or* 1904. [13 entries, 4 absent.]

2193 **I.** (£10.)—THE VISITING COMMITTEE, MIDDLESEX COUNTY ASYLUM, Tooting, Surrey, for **Wandsworth Gem** 11054, born Dec. 2, 1904, farrowed Jan. 29, 1906 ; *s.* Motcombe Prince 9567, *d.* Countess of Wandsworth 14th 10306 *by* Danesfield Duke.

2189 **II.** (£5.)—SIR ALEXANDER HENDERSON, BT., Buscot Park, Faringdon, for **Buscot Ethel** 10562, born July 17, 1903, farrowed Jan. 4, 1906 ; *s.* Danesfield Julius 8153, *d.* Stella 8343 *by* Buscot Dairyman 7305.

2187 **III.** (£3.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Polegate Dovecote** 9819, born Dec. 2, 1903, farrowed Jan. 2, 1906 ; *s.* Cecil Augustus 7756, *d.* Polegate Debate 9157 *by* Baron Kitchener 8403.

2191 **R. N. & H. C.**—G. TALFOURD INMAN, for **Highmoor Dowager.**

[1] The sum of £42 towards these Prizes was given by the British Berkshire Society.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

Class 275.—*Berkshire Sows, farrowed in* 1905. [12 entries, 1 absent.]

2198 **I.** (£10.)—THE DUCHESS OF DEVONSHIRE, Compton Place, Eastbourne, for **Polegate Daylight** 10379, born Jan. 2; *s.* Cecil Augustus 7756, *d.* Polegate Day Dream 9159 *by* Baron Kitchener 8403.

2201 **II.** (£5.)—JULIUS A. FRICKER, Burton, Mere, Wilts., for sow, born Sept. 2; *s.* Freshman F. B. 10081, *d.* Gillingham S. 9076 *by* Faithful Commons 6640.

2208 **III.** (£3.)—E. J. MORANT, Heathy Dilton, Boldre, Lymington, for sow, born Jan. 27; *s.* Marlborough 2nd 10581, *d.* Hayward Beauty *by* Manor Palladwr 9247.

2203 **R. N. & H. C.**—THE HON. A. HOLLAND-HIBBERT, Munden, Watford, for **Burbidge 22nd.**

Class 276.—*Pens of Three Berkshire Sow Pigs, farrowed in* 1906. [13 entries, none absent.]

2213 **I.** (£10.)—JULIUS A. FRICKER, Burton, Mere, Wilts., for pen, born Jan.; *s.* Hightide F. B. 9373, *d.* Gillingham L. 9077 *by* Faithful Commons 6640.

2210 **II.** (£5.)—G. J. B. CHETWYND, Wyndthorpe, Doncaster, for pen, born Jan. 8 and 14; *s.* Don Confidence 10987, *ds.* Don Constancy 10989 and Don Curiosity 10988.

2220 **III.** (£3.)—JAMES W. KIMBER, Fyfield Wick, Abingdon, for pen, born Jan. 8; *ss.* Syntax 9887 and Prince Rubicel 10761, *ds.* Wick Rubicel 9885 *by* Buckingham 8888 and Magnetic A1 8886 *by* Blackham 5215.

2209 **R. N. & H. C.**—LORD CALTHORPE, Elvetham Park, Winchfield.

Tamworth Breed.[1]

Class 277.—*Tamworth Boars, farrowed in* 1904 *or* 1905. [11 entries, 1 absent.]

2225 **I.** (£10.)—ROBERT IBBOTSON, The Hawthorns, Knowle, Warwickshire, for **Knowle Bounder** 8945, born Jan. 4, 1904, bred by H. C. Stephens, Cholderton, Salisbury; *s.* Whitacre Bounder 7511, *d.* Cholderton Favourite 11th 13400 *by* Knowle Forester.

2226 **II.** (£5.)—ROBERT IBBOTSON, for **Joey** 9505, born Oct. 9, 1904, bred by H. C. Stephens, Cholderton, Salisbury; *s.* Whitacre Bounder 7511, *d.* Whitacre Favourite 7830 *by* Knowle Rector 3783.

2229 **III.** (£3.)—H. C. STEPHENS, Cholderton, Salisbury, for **Cholderton Rupert,** born Jan. 20, 1905; *s.* Cholderton-de-Cusack 7435, *d.* Cholderton Beauty *by* Whitacre Welshman 5411.

2232 **R. N. & H. C.**—SIR PETER WALKER, BT., Osmaston Manor, Derby, for **Osmaston Jim.**

Class 278.—*Pens of Three Tamworth Boar Pigs, farrowed in* 1906. [4 entries, none absent.]

2235 **I.** (£10.)—ROBERT IBBOTSON, The Hawthorns, Knowle, for pen, born Jan. 16; *s.* Knowle Bounder 8945, *d.* Cholderton Buzzer 13388 *by* Knowle Forester 5369.

2234 **II.** (£5.)—F. W. GILBERT & CO., Cuttle Bridge Creamery, Swarkestone, Derby, for **Mickleover Faust, Mickleover Forester, Mickleover Friar,** born Feb. 2; *s.* Mickleover Monster 8965, *d.* Mickleover Holly 16540 *by* Osmaston Prince 8367.

2236 **R. N. & H. C.**—H. C. STEPHENS, Cholderton, Salisbury.

Class 279.—*Tamworth Breeding Sows, farrowed in* 1902, 1903, *or* 1904. [9 entries, 2 absent.]

2238 **I.** (£10, & **Champion.**[2])—ROBERT IBBOTSON, The Hawthorns, Knowle, for **Cholderton Buzzer** 13388, born July 19, 1902, farrowed Jan. 16, 1906, bred by H. C. Stephens, Cholderton, Salisbury; *s.* Knowle Forester 5369, *d.* Cholderton Beauty 12038 *by* Whitacre Welshman 5411.

2240 **II.** (£5.)—JOHN MYATT, Lynn House, Walsall, for **Lynn Lucy** 15296, born Dec. 5, 1902, farrowed Jan. 25, 1906; *s.* Whitacre Bishop 8389, *d.* Kingsbury Lass 15256 *by* Cliff Crystal 4923.

2244 **III.** (£3.)—SIR PETER WALKER, BT., Osmaston Manor, Derby, for **Osmaston Pansy 2nd** 17966, born Aug. 11, 1903, farrowed March 9, 1906; *s.* Mickleover Duke 7489, *d.* Osmaston Pansy 12168 *by* Osmaston Duke 6841.

2237 **R. N. & H. C.**—CHARLES BATHURST, JUN., Lydney, for **Whitacre Geranium.**

Class 280.—*Tamworth Sows, farrowed in* 1905. [7 entries, none absent.]

2247 **I.** (£10, & **R. N. for Champion.**[2])—ROBERT IBBOTSON, The Hawthorns, Knowle, for **Gun Hill Mater** 17882, born Jan. 2, bred by Mrs. E. Ibbotson, Gun Hill, Arley, Warwickshire; *s.* Knowle Comus 8305, *d.* Gun Hill Coronation 13456 *by* Knowle Welshman 2nd 6815.

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[1] The sum of £35 towards these Prizes was given by the National Pig Breeders' Association.

[2] Champion Gold Medal, value £5 5*s.*, given by the National Pig Breeders' Association for the best Tamworth Boar or Sow in Classes 277, 279, and 280.

[Unless otherwise stated, each prize animal named below was "bred by exhibitor."]

2252 **II.** (£5), & 2251 **III.** (£3.)—H. C. STEPHENS, Cholderton, Salisbury, for sow, born Jan. 2; *s.* Cholderton-de-Cusack 7435, *d.* Cholderton Beauty *by* Knowle Forester.
2250 **R. N. & H. C.**—H. C. STEPHENS, for **Cholderton Ena.**

Class 281.—*Pens of Three Tamworth Sow Pigs, farrowed in* 1906.
[5 entries, none absent.]

2257 **I.** (£10.)—H. C. STEPHENS, Cholderton, Salisbury, for pen, born Jan. 2; *s.* Rolleston Victor 8375, *d.* Cholderton Beauty *by* Knowle Forester 5369.
2256 **II.** (£5.)—JOHN MYATT, Lynn House, Walsall, for pen, born Jan. 25; *s.* Knowle Neptune 8957, *d.* Lynn Lucy 15296 *by* Whitacre Bishop 8389.
2255 **R. N. & H. C.**—ROBERT IBBOTSON, The Hawthorns, Knowle, Warwickshire.

Large Black Breed.[1]

Class 282.—*Large Black Boars, farrowed in* 1904 *or* 1905.
[11 entries, 1 absent.]

2262 **I.** (£10, & Champion.[2])—C. F. MARRINER, Thorpe Hall, Hasketon, Woodbridge, for **Hasketon Black King 4th** 1129, born Feb. 12, 1904; *s.* Black King 545, *d.* Long Lady 1808.
2267 **II.** (£5, & R. N. for Champion.[2])—THOMAS WARNE, Trevisquite Manor, St. Mabyn, for **Trevisquite Excelsior** 1487, born May 19, 1905; *s.* Trevisquite Confidence 1203, *d.* Trevisquite Mistress 4562 *by* Trevisquite Cornish 937.
2258 **III.** (£3.)—THE EARL OF ANCASTER, Normanton Park, Stamford, for **Normanton Hero** 1477, born Jan. 1, 1905, bred by A. S. Mann, Little Bentley Hall, Colchester; *s.* Usibepu 1151, *d.* Matilda 2076 *by* Duke of Devonshire 2nd 321.
2261 **R. N. & H. C.**—H. J. KINGWELL, Great Aish, South Brent, for **Brent Pride 1st.**

Class 283.—*Large Black Boar Pigs, farrowed in* 1906.
[20 entries, 4 absent.]

2279 **I.** (£10.)—C. F. MARRINER, Thorpe Hall, Hasketon, Woodbridge, for boar pig, born Jan. 2; *s.* Hasketon Black King 4th 1129, *d.* Frith Manor Polly 2nd 4430 *by* Black King Coffee 1167.
2286 **II.** (£5.)—JOHN WARNE, Treveglos, St. Mabyn, for boar pig, born Jan. 2; *s.* Treveglos Darky Jim 1199, *d.* Treveglos Beauty 2046 *by* Tinten Happy Boy 139.
2269 **III.** (£3.)—KENNETH M. CLARK, Sudbourne Hall, Orford, Suffolk, for boar pig, born Jan. 1; *s.* Sudbourne Start 1209, *d.* Sudbourne Sarah B. 4598 *by* Iford Baron 587.
2270 **R. N. & H. C.**—KENNETH M. CLARK.

Class 284.—*Large Black Breeding Sows, farrowed in* 1902, 1903, 1904, *or* 1905.
[18 entries, 2 absent.]

2296 **I.** (£10, & Cup.[3])—C. F. MARRINER, Thorpe Hall, Hasketon, Woodbridge, for **Hasketon Long Lady** 3592, born Jan. 14, 1903, farrowed Jan. 12, 1906; *s.* Royal Bodmin 455, *d.* Long Lady 1808.
2303 **II.** (£5, & R. N. for Cup.[3])—JOHN WARNE, Treveglos, St. Mabyn, for **Treveglos Hopeful** 2580, born July 6, 1902, farrowed April 27, 1906; *s.* Trevisquite Leader 403, *d.* Treveglos Jet 2042 *by* Young Cornishman.
2300 **III.** (£3.)—R. R. ROTHWELL, Fulwood Hall Farm, Preston, for **Trevisquite Crafty 3rd** 3626, born June 20, 1903, farrowed Jan. 11, 1906, bred by Thomas Warne, Trevisquite Manor, St. Mabyn; *s.* Trevisquite Leader 2nd 681, *d.* Trevisquite Crafty 2nd 2548 *by* Trevisquite Leader 403.
2295 **R. N. & H. C.**—C. F. MARRINER, for **Hasketon Long Bess 4th.**

Class 285.—*Pens of Three Large Black Sow Pigs, farrowed in* 1906.
[13 entries, none absent.]

2314 **I.** (£10.)—C. F. MARRINER, Thorpe Hall, Hasketon, Woodbridge, for pen, born Jan. 2 and 3; *s.* Hasketon Black King 4th 1129, *ds.* Frith Manor Lassie 1st 4426 and Frith Manor Beauty 3rd 4432.
2318 **II.** (£5.)—JOHN WARNE, Treveglos, St. Mabyn, for pen, born Jan. 10; *s.* Trevisquite Confidence 1203, *d.* Treveglos Lady 5404 *by* Cornish King 873.
2310 **III.** (£3.)—THOMAS GOODCHILD, Great Yeldham Hall, Castle Hedingham, S.O., Essex, for pen, born Jan. 15 and 18; *s.* Trescowe Prince 657, *ds.* Tartar Princess 11th *by* Tunstall Tragedy, and Tartar Princess 25th 3858 *by* Castle Ben 573.
2315 **R. N. & H. C.**—J. OSCAR MUNTZ, Goodameavy, Yelverton, Devon.

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[1] The sum of £24 towards these Prizes was given by the Large Black Pig Society.
[2] Champion Prize of £10 given by the Large Black Pig Society for the best Large Black Boar in Classes 282 and 283.
[3] Silver Challenge Cup, value Twenty Guineas, given by the Large Black Pig Society for the best Sow in Class 284, the Cup to become the absolute property of an Exhibitor winning it twice in succession or three times in all.

POULTRY.

By "Cock," "Hen," "Drake," "Duck," "Gander," and "Goose," are meant birds hatched previous to January 1, 1906; and by "Cockerel," "Pullet," "Young Drake," and "Duckling," are meant birds hatched in 1906, previous to June 1.

Game.

Class 286.—*Old English Game Cocks.* [11 entries, 1 absent.]

2325 **I.** (20*s.*), & 2326 **III.** (5*s.*)—T. C. HEATH, Keele, Newcastle, Staffs.
2324 **II.** (10*s.*)—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.
2328 **R. N. & H. C.**—R. LAWTON, Boothorpe House, Woodville, Burton-on-Trent.

Class 287.—*Old English Game Hens.* [12 entries, none absent.]

2333 **I.** (20*s.*)—COLLINS & NEWALL, Newsham, Blyth.
2335 **II.** (10*s.*)—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.
2331 **III.** (5*s.*)—BERESFORD & TAYLOR, Derwent Poultry Farm, Belper, Derby.
2336 **R. N. & H. C.**—T. C. HEATH, Keele, Newcastle, Staffs.

Class 288.—*Old English Game Cockerels.* [5 entries, none absent.]

2343 **I.** (20*s.*)—CYRIL BOULTER, Godstone, Surrey.
2346 **II.** (10*s.*)—R. LAWTON, Boothorpe House, Woodville, Burton-on-Trent.
2345 **R. N. & H. C.**—JAMES GREEN, Silsden, near Keighley.

Class 289.—*Old English Game Pullets.* [5 entries, 1 absent.]

2352 **I.** (20*s.*)—JOSEPH J. REED, Silly, Wrea, Langley-on-Tyne.
2350 **II.** (10*s.*), & 2349 **R. N. & H. C.**—PHILIP A. FISHER, Carhead, Crosshills, Keighley.

Class 290.—*Indian Game Cocks.* [12 entries, 1 absent.]

2361 **I.** (20*s.*)—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.
2354 **II.** (10*s.*)—BERESFORD & TAYLOR, Derwent Poultry Farm, Belper, Derby.
2358 **III.** (5*s.*)—FIRTH BROTHERS, Wharton Farm, Acton Vale, London, W.
2356 **R. N. & H. C.**—W. H. CRANE, Great Barr Hall, near Birmingham.

Class 291.—*Indian Game Hens.* [14 entries, 1 absent.]

2372 **I.** (20*s.*), & 2373 **R. N. & H. C.**—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.
2375 **II.** (£10*s.*)—R. LAWTON, Boothorpe House, Woodville, Burton-on-Trent.
2367 **III.** (5*s.*)—WILLIAM BRENT, Clampit, Callington.

Class 292.—*Indian Game Cockerels.* [10 entries, none absent.]

2384 **I.** (20*s.*)—GEORGE FAULKNER, Rowton, Chester.
2385 **II.** (10*s.*)—FIRTH BROTHERS, Wharton Farm, Acton Vale, London, W.
2382 **III.** (5*s.*)—WILLIAM BRENT, Clampit, Callington.
2383 **R. N. & H. C.**—LAURENCE CURRIE, Minley Manor, Farnborough.

Class 293.—*Indian Game Pullets.* [8 entries, 1 absent.]

2394 **I.** (20*s.*)—JAMES FRAYNE, Piper's Pool, Egloskerry.
2391 **II.** (10*s.*)—WILLIAM BRENT, Clampit, Callington.
2389 **III.** (5*s.*)—BERESFORD & TAYLOR, Derwent Poultry Farm, Belper, Derby.
2396 **R. N. & H. C.**—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.

Dorkings.

Class 294.—*Coloured Dorking Cocks.* [10 entries, 2 absent.]

2403 **I.** (20*s.*)—LADY ALICE STANLEY, Cowarth Park, Sunningdale.
2397 **II.** (10*s.*)—CHARLES AITKENHEAD, Stud Farm, Seaham Harbour.
2400 **III.** (5*s.*)—GEORGE H. PROCTER, Flass House, Durham.
2402 **R. N. & H. C.**—HERBERT REEVES, Northlands, Emsworth.

Class 295.—*Coloured Dorking Hens.* [10 entries, none absent.]

2410 **I.** (20*s.*)—GEORGE H. PROCTER, Flass House, Durham.
2412 **II.** (10*s.*)—HERBERT REEVES, Northlands, Emsworth.
2409 **III.** (5*s.*)—ARTHUR C. MAJOR, Ditton, Langley.
2408 **R. N. & H. C.**—THOMAS BRIDEN, Cononley, *viâ* Keighley.

Class 296.—*Coloured Dorking Cockerels.* [8 entries, none absent.]

2421 **I.** (20*s.*), & 2420 **II.** (10*s.*)—HERBERT REEVES, Northlands, Emsworth.
2419 **III.** (5*s.*)—ROBERT JACKSON, Dawdon Hill Farm, Seaham Harbour.
2424 **R. N. & H. C.**—MRS. WHITTLE, Stokesley, R.S.O., Yorks.

Class 297.—*Coloured Dorking Pullets.* [8 entries, none absent.]

2428 I. (20*s.*), & 2429 III. (5*s.*)—HERBERT REEVES, Northlands, Emsworth.
2425 II. (10*s.*)—THOMAS BRIDEN, Cononley, *viâ* Keighley.
2432 R. N. & H. C.—MRS. WHITTLE, Stokesley, R.S.O., Yorks.

Class 298.—*Silver Grey Dorking Cocks.* [6 entries, none absent.]

2435 I. (20*s.*)—ARTHUR C. MAJOR, Ditton, Langley.
2438 II. (10*s.*)—LADY ALICE STANLEY, Cowarth Park, Sunningdale.
2437 III. (5*s.*)—HERBERT REEVES, Northlands, Emsworth.
2433 R. N. & H. C.—HON. FLORENCE AMHERST, Didlington Hall, Stoke Ferry.

Class 299.—*Silver Grey Dorking Hens.* [8 entries, none absent.]

2445 I. (20*s.*)—HERBERT REEVES, Northlands, Emsworth.
2442 II. (10*s.*), & 2441 III. (5*s.*)—ARTHUR C. MAJOR, Ditton, Langley.
2446 R. N. & H. C.—LADY ALICE STANLEY, Cowarth Park, Sunningdale.

Class 300.—*Silver Grey Dorking Cockerels.* [5 entries, 1 absent.]

2449 I. (20*s.*)—ARTHUR C. MAJOR, Ditton, Langley.
2451 II. (10*s.*), & 2450 R. N. & H. C.—HERBERT REEVES, Northlands, Emsworth.

Class 301.—*Silver Grey Dorking Pullets.* [6 entries, 1 absent.]

2457 I. (20*s*), & 2456 II. (10*s.*)—HERBERT REEVES, Northlands, Emsworth.
2455 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley.

Class 302.—*Dorking Cocks or Cockerels, White, or any other variety.* [3 entries, 1 absent.]

2459 I. (20*s.*)—DR. H. C. TITTERTON, Vine Cottage, Norwood Green, Southall. (White.)
2458 R. N. & H. C.—ARTHUR C. MAJOR, Ditton, Langley. (Rose Combed.)

Class 303.—*Dorking Hens or Pullets, White, or any other variety.* [5 entries, none absent.]

2463 I. (20*s.*), 2465 II. (10*s.*), & 2464 R. N. & H. C.—DR. HERBERT C. TITTERTON, Vine Cottage, Norwood Green, Southall. (White.)

Sussex.

Class 304.—*Red or Brown Sussex Cocks or Cockerels.* [7 entries, none absent.]

2467 I. (20*s.*)—S. G. FROST, Dunsmore, Horeham Road. (Red.)
2469 II. (10*s.*)—H. S. HODGES, Dell Poultry Farms, Heathfield. (Red.)
2472 III (5*s.*)—LORD ROTHSCHILD, Tring Park, Herts. (Red.)
2470 R. N. & H. C.—J. P. HOWARD, Glynde Mill, Lewes. (Red.)

Class 305.—*Red or Brown Sussex Hens or Pullets.* [6 entries, none absent.]

2473 I. (20*s.* & R. N. for Medal.[1])—S. G. FROST, Dunsmore, Horeham Road. (Red.)
2474 II. (10*s.*)—BRUCE F. FURNISS. Chiddingly Park, Sussex. (Red.)
2476 III. (5*s.*)—R. B. ROGERS, Eastwood, Hurstmonceux. (Red.)
2477 R. N. & H. C.—LORD ROTHSCHILD, Tring Park, Herts. (Red.)

Class 306.—*Light Sussex Cocks or Cockerels.* [4 entries, none absent.]

2481 I. (20*s.*)—LORD ROTHSCHILD, Tring Park, Herts.
2482 II. (10*s.*)—W. S. TUCKER, Southover, Lewes.
2479 R. N. & H. C.—BRUCE F. FURNISS, Chiddingly Park, Sussex.

Class 307.—*Light Sussex Hens or Pullets.* [7 entries, none absent.]

2486 I. (20*s.*)—JAMES HEPBURN, Home Farm, Laughton, Shortgate.
2487 II. (10*s.*)—H. S. HODGES, Dell Poultry Farms, Lewes.
2485 III. (5*s.*)—BRUCE F. FURNISS, Chiddingly Park, Sussex.
2488 R. N. & H. C.—J. P. HOWARD, Glynde Mill, Lewes.

Class 308.—*Speckled Sussex Cocks or Cockerels.* [4 entries, none absent.]

2492 I. (20*s.*)—GEORGE JOSEPH LENNY, The Retreat, Buxted.
2490 II. (10*s.*)—JOHN BRIDGE, Station Road, Polegate.
2491 R. N. & H. C.—BRUCE F. FURNISS, Chiddingly Park, Sussex.

Class 309.—*Speckled Sussex Hens or Pullets.* [4 entries, none absent.]

2494 I. (20*s.* & Medal.[1])—GEORGE JOSEPH LENNY, The Retreat, Buxted.
2497 II. (10*s.*)—FRANK A. WALLING, 7 Cavendish Cottages, Eastbourne.
2496 R. N. & H. C.—W. S. TUCKER, Southover, Lewes.

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[1] Silver Medal given by the Sussex Poultry Club for the best Bird of the Sussex varieties in Classes 304-309.

Brahmas and Cochins.

Class 310.—*Brahma Cocks or Cockerels.* [5 entries, none absent.]

2499 I. (20*s.*)—CHARLES PRESTON, Manor House, Farlsheaton, Dewsbury.
2500 II. (10*s.*)—HERBERT SPENSLEY, Oaks Farm, Minston, *viâ* Leeds.
2498 R. N. & H. C.—JAMES LORD, Underbank, Thornton-le-Fylde.

Class 311.—*Brahma Hens or Pullets.* [7 entries, none absent.]

2504 I. (20*s.*)—JAMES LORD, Underbank, Thornton-le-Fylde.
2506 II. (10*s.*)—HERBERT SPENSLEY, Oaks Farm, Minston, *viâ* Leeds.
2505 III. (5*s.*)—CHARLES PRESTON, Manor House, Earlsheaton, Dewsbury.
2508 R. N. & H. C.—TOM WOODCOCK, Burton Fen Poultry Farm, Lincoln.

Class 312.—*Cochin Cocks or Cockerels.* [6 entries, 2 absent.]

2513 I. (20*s.*)—GEORGE H. PROCTER, Flass House, Durham.
2511 II. (10*s.*), & 2512 R. N. & H. C.—J. B. GILBERT, Musbury, Axminster.
2514 III. (5*s.*)—ROBERT S. WILLIAMSON, The Grange, Hednesford.

Class 313.—*Cochin Hens or Pullets.* [3 entries, none absent.]

2517 I. (20*s.*)—GEORGE H. PROCTER, Flass House, Durham.
2518 R. N. & H. C.—ROBERT S. WILLIAMSON, The Grange, Hednesford.

Langshans.

Class 314.—*Langshan Cocks or Cockerels.* [12 entries, none absent.]

2524 I. (20*s.*)—G. FIELDER, 28 Hill Road, Wimbledon.
2526 II. (10*s.*)—FRANK HARGREAVES, Merton Grange, Gamlingay.
2529 III. (5*s.*)—MRS. CLARA WAGSTAFF, 70 Hamstead Road, Handsworth.
2520 R. N. & H. C.—R. BUTLAND, Occombe, Paignton.

Class 315.—*Langshan Hens or Pullets.* [10 entries, none absent.]

2536 I. (20*s.*)—CHARLES PRESTON, Manor House, Earlsheaton, Dewsbury.
2539 II. (10*s.*)—HARRY WALLIS, Northend, Warley, Brentwood.
2531 III. (5*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley.
2537 R. N. & H. C.—J. W. TAYLOR, Riddings, near Alfreton.

Plymouth Rocks.

Class 316.—*Plymouth Rock Cocks.* [13 entries, 1 absent.]

2545 I. (20*s.*)—E. S. JACKSON M.D., Carnforth.
2547 II. (10*s.*)—E. MARSHALL, 7 Gregory Street, Lenton, Nottingham.
2542 III. (5*s.*)—MISS ANNIE BURROW, Buckstone House, Carnforth.
2541 R. N. & H. C.—FRANK BATEMAN, The Lodge, Shinfield, Reading.

Class 317.—*Plymouth Rock Hens.* [11 entries, 1 absent.]

2554 I. (20*s.*)—JAMES BATEMAN, Milnthorpe, Westmorland.
2558 II. (10*s.*)—E. MARSHALL, 7 Gregory Street, Lenton, Nottingham.
2556 III. (5*s.*)—J. MARSDEN CHANDLER, 2 Soresby Street, Chesterfield.
2557 R. N. & H. C.—E. S. JACKSON, M.D., Carnforth.

Class 318.—*Plymouth Rock Cockerels.* [11 entries, none absent.]

2565 I. (20*s.*)—A. R. BATTY, Kirkbeck Farm, Bentham, Lancaster.
2567 II. (10*s.*)—MISS ANNIE BURROW, Buckstone House, Carnforth.
2570 III. (5*s.*)—FRANK NEAVE, Lingwood, Norwich.
2569 R. N. & H. C.—E. S. JACKSON, M.D., Carnforth.

Class 319.—*Plymouth Rock Pullets.* [16 entries, none absent.]

2586 I. (20*s.*), & 2585 II. (10*s.*)—FRANK NEAVE, Lingwood, Norwich.
2589 III. (5*s.*)—WILLIAM SLATER, Highfield, Lancaster.
2578 R. N. & H. C.—ROBERT CHIPPINDALE, Hampson Green, Ellel.

Wyandottes.

Class 320.—*Gold or Silver Laced Wyandotte Cocks.* [10 entries, 2 absent.]

2592 I. (20*s.*)—O. F. BATES, Harlow Court, Harrogate. (Silver.)
2598 II. (10*s.*)—CHARLES PRESTON, Manor House, Earlsheaton, Dewsbury. (Silver.)
2599 III. (5*s.*)—JOHN PROCTER, Goosnargh Mill, near Preston. (Gold.)
2593 R. N. & H. C.—JOHN BEE, Bulsnape Hall, Goosnargh, near Preston. (Gold.)

Class 321.—*Gold or Silver Laced Wyandotte Hens.* [8 entries, 1 absent.]

2608 I. (20*s.*)—CHARLES PRESTON, Manor House, Earlsheaton, Dewsbury. (Silver.)
2602 II. (10*s.*)—O. F. BATES, Harlow Court, Harrogate. (Gold.)
2603 III. (5*s.*)—CHARLES W. DUNN, Mosley Farm, Rolleston, Burton-on-Trent. (Silver.)
2609 **R. N. & H. C.**—A. C. RUSSELL, The Grange, Ellesmere Park, Eccles. (Silver.)

Class 322.—*Gold or Silver Laced Wyandotte Cockerels.* [16 entries, 3 absent.]

2615 I. (20*s.*)—TOM H. FURNESS, Carlton House, Chesterfield.
2611 II. (10*s.*)—O. F. BATES, Harlow Court, Harrogate. (Gold.)
2617 III. (5*s.*)—M. G. GOLDSMITH, Blendworth, Horndean. (Gold.)
2612 **R. N. & H. C.**—JOHN BEE, Bulsnape Hall, Goosnargh, near Preston. (Gold.)

Class 323.—*Gold or Silver Laced Wyandotte Pullets.* [14 entries, 2 absent.]

2636 I. (20*s.*)—J. M. PHILIPSON, Fell House, Haydon Bridge. (Silver.)
2634 II. (10*s.*)—HENRY MAIDMENT, Hayton Gate, Low Row, Cumberland. (Silver.)
2627 III. (5*s.*)—O. F. BATES, Harlow Court, Harrogate. (Silver.)
2638 **R. N. & H. C.**—JOHN PROCTER, Goosnargh Mill, near Preston. (Gold.)

Class 324.—*White Wyandotte Cocks.* [11 entries, 1 absent.]

2644 I. (20*s.*)—C. N. GOODE, Peckfield Lodge, South Milford.
2642 II. (10*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood.
2641 III. (5*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley.
2651 **R. N. & H. C.**—HUBERT WRIGHT, Mayfield, Keighley.

Class 325.—*White Wyandotte Hens.* [13 entries, 2 absent.]

2664 I. (20*s.*)—HUBERT WRIGHT, Mayfield, Keighley.
2656 II. (10*s.*)—C. N. GOODE, Peckfield Lodge, South Milford.
2652 III. (5*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley.
2659 **R. N. & H. C.**—JOSHUA LOCKWOOD, Intake Lane Poultry Farm, Ossett.

Class 326.—*White Wyandotte Cockerels.* [15 entries, 4 absent.]

2671 I. (20*s.*)—TOM H. FURNESS, Carlton House, Chesterfield.
2677 II. (10*s.*)—PETLEY L. A. PRICE, Hayeswood, Pembury, Kent.
2666 III. (5*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood.
2665 **R. N. & H. C.**—R. ANTHONY, Home Farm, Euxton, Chorley.

Class 327.—*White Wyandotte Pullets.* [18 entries, 1 absent.]

2682 I. (20*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood.
2680 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley.
2689 III. (5*s.*)—C. N. GOODE, Peckfield Lodge, South Milford.
2688 **R. N. & H. C.**—TOM H. FURNESS, Carlton House, Chesterfield.

Class 328.—*Partridge Wyandotte Cocks.* [18 entries, 2 absent.]

2713 I. (20*s.*), & 2715 III. (5*s.*)—HUBERT WRIGHT, Mayfield, Keighley.
2699 II. (10*s.*)—O. F. BATES, Harlow Court, Harrogate.
2710 **R. N. & H. C.**—COL. S. SANDBACH, Hafodunos, Abergele.

Class 329.—*Partridge Wyandotte Hens.* [10 entries, none absent.]

2725 I. (20*s.*), & 2724 II. (10*s.*)—HUBERT WRIGHT, Mayfield, Keighley.
2716 III. (5*s.*)—M. W. & C. A. ARMSTRONG, The Manor House, Farningham.
2723 **R. N. & H. C.**—COL. S. SANDBACH, Hafodunos, Abergele.

Class 330.—*Partridge Wyandotte Cockerels.* [7 entries, 1 absent.]

2727 I. (20*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood.
2731 II. (10*s.*)—COL. S. SANDBACH, Hafodunos, Abergele.
2726 III. (5*s.*)—M. W. & C. A. ARMSTRONG, The Manor House, Farningham.
2732 **R. N. & H. C.**—HUBERT WRIGHT, Mayfield, Keighley.

Class 331.—*Partridge Wyandotte Pullets.* [10 entries, 2 absent.]

2735 I. (20*s.*)—HUGH GUNN, Castle Villa, Sandhurst Road, Gloucester.
2741 II. (10*s.*)—COL. S. SANDBACH, Hafodunos, Abergele.
2742 III. (5*s.*)—HUBERT WRIGHT, Mayfield, Keighley.
2739 **R. N. & H. C.**—A. F. MINNITT, St. Luke's Vicarage, Formby.

Class 332.—*Wyandotte Cocks or Cockerels, any other variety.* [10 entries, none absent.]

2747 I. (20*s.*)—O. F. BATES, Harlow Court, Harrogate. (Silver pencilled.)
2743 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley. (Buff.)
2745 III. (5*s.*)—HARRY C. ARDRON, The Fosse, Syston, Leicester. (Silver pencilled.)
2749 **R. N. & H. C.**—TOM H. FURNESS, Carlton House, Chesterfield. (Silver pencilled.)

Class 333.—*Wyandotte Hens or Pullets, any other variety.*
[7 entries, 1 absent.]

2753 **I.** (20*s.*)—R. ANTHONY, Home Farm, Euxton, Chorley. (Buff.)
2759 **II.** (10*s.*)—HUBERT WRIGHT, Mayfield, Keighley. (Silver pencilled.)
2756 **III.** (5*s.*)—A. MORTEN, Beeley Hill Top, Rowsley. (Silver pencilled.)
2758 **R. N. & H. C.**—RICHARD POWELL, 28 Derby Road, Gloucester. (Blue laced.)

Orpingtons.

Class 334.—*Buff Orpington Cocks.* [19 entries, 2 absent.]

2778 **I.** (20*s.*)—COL. S. SANDBACH, Hafodunos, Abergele.
2760 **II.** (10*s.*), & 2761 **R. N. & H. C.**—FRANK BATEMAN, The Lodge, Shinfield, Reading.
2766 **III.** (5*s.*)—W. COOK & SONS, Orpington House, St. Mary Cray, Kent.

Class 335.—*Buff Orpington Hens.* [5 entries, none absent.]

2782 **I.** (20*s.*)—GEORGE H. PROCTER, Flass House, Durham.
2780 **II.** (10*s.*), 2779 **III.** (5*s.*), & 2781 **R. N. & H. C.**—W. COOK & SONS, Orpington House, St. Mary Cray, Kent.

Class 336.—*Buff Orpington Cockerels.* [13 entries, 2 absent.

2785 **I.** (20*s.*)—FRANK BATEMAN, The Lodge, Shinfield, Reading.
2789 **II.** (10*s.*)—HENRY FILDES, Hill House, Mobberley, Cheshire.
2788 **III.** (5*s.*)—ENTWISTLE BROTHERS, The Grove Farm, Westhoughton, near Bolton.
2794 **R. N. & H. C.**—CHARLES KEETLEY, Easthorpe Cottage, Lowdham, Notts.

Class 337.—*Buff Orpington Pullets.* [20 entries, 1 absent.]

2801 **I.** (20*s.*), & 2802 **R. N. & H. C.**—ENTWISTLE BROTHERS, The Grove Farm, Westhoughton, near Bolton.
2814 **II.** (10*s.*)—F. W. TAYLOR & Co., The Firs, Heronsgate, Rickmansworth.
2803 **III.** (5*s.*)—HENRY FILDES, Hill House, Mobberley, Cheshire.

Class 338.—*White Orpington Cocks.* [6 entries, none absent.]

2820 **I.** (20*s.*), & 2819 **III.** (5*s.*)—W. COOK & SONS, Orpington House, St. Mary Cray, Kent.
2818 **II.** (10*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood, Hants.
2817 **R. N. & H. C.**—R. ANTHONY, Home Farm, Euxton, near Chorley.

Class 339.—*White Orpington Hens.* [13 entries, 4 absent.]

2835 **I.** (20*s.*)—C. W. WASHINGTON, Shroggs Farm, Copley, near Halifax.
2824 **II.** (10*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood, Hants.
2828 **III.** (5*s.*)—ENTWISTLE BROTHERS, The Grove Farm, Westhoughton, near Bolton.
2825 **R. N. & H. C.**—FRANK BLOOMER, Foxcote, Stourbridge.

Class 340.—*White Orpington Cockerels.* [9 entries, 1 absent.]

2836 **I.** (20*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2837 **II.** (10*s.*)—FRANK BATEMAN, The Lodge, Shinfield, Reading.
2838 **III.** (5*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood, Hants.
2839 **R. N. & H. C.**—W. COOK & SONS, Orpington House, St. Mary Cray, Kent.

Class 341.—*White Orpington Pullets.* [9 entries, none absent.]

2845 **I.** (20*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2847 **II.** (10*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood, Hants.
2846 **III.** (5*s.*)—FRANK BATEMAN, The Lodge, Shinfield, Reading.
2853 **R. N. & H. C.**—F. W. TAYLOR & Co., The Firs, Heronsgate, Rickmansworth.

Class 342.—*Black Orpington Cocks.* [16 entries, 3 absent.]

2859 **I.** (20*s.*)—THE REV. F. SUTTON DODD, Yardley Vicarage, Birmingham.
2855 **II.** (10*s.*), & 2856 **R. N. & H. C.**—W. COOK & SONS, Orpington House, St. Mary Cray.
2864 **III.** (5*s.*)—CHARLES PRESTON, Manor House, Earlsheaton, near Dewsbury.

Class 343.—*Black Orpington Hens.* [10 entries, 4 absent.]

2870 **I.** (20*s.*)—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood, Hants.
2874 **II.** (10*s.*)—CHARLES PRESTON, The Manor House, Earlsheaton, near Dewsbury.
2871 **III.** (5*s.*), & 2872 **R. N. & H. C.**—W. COOK & SONS, Orpington House, St. Mary Cray.

Class 344.—*Black Orpington Cockerels.* [3 entries, 1 absent.]

2882 **I.** (20*s.*)—JAMES CROCKER, Newark Road, Collingham, Newark.
2880 **R. N. & H. C.**—WILLIAM MOORE BELL, St. Leonards Poultry Farm, Ringwood.

Class 345.—*Black Orpington Pullets.* [5 entries, 1 absent.]

2886 **I.** (20*s.*)—F. W. TAYLOR & Co., The Firs, Heronsgate, Rickmansworth.
2885 **R. N. & H. C.**—JAMES CROCKER, Newark Road, Collingham, Newark.

French.

Class 346.—*Faverolle Cocks or Cockerels.* [6 entries, none absent.]

2890 I. (20*s.*), & 2891 II. (10*s.*)—JOSEPH GREENE, Hermitage Poultry Farm, Wexford.
2889 III. (5*s.*)—LADY EVELYN COTTERELL, Garnons, Herefordshire.
2893 R. N. & H. C.—MISS ALICE PETERS, Withington, near Hereford.

Class 347.—*Faverolle Hens or Pullets.* [6 entries, none absent.]

2897 I. (20*s.*), & 2896 II. (10*s.*)—JOSEPH GREENE, Hermitage Poultry Farm, Wexford.
2895 III. (5*s.*)—LADY EVELYN COTTERELL, Garnons, Herefordshire.
2898 R. N. & H. C.—FRANK HARGREAVES, Merton Grange, Gamlingay.

Class 348.—*French Cocks or Cockerels, any other variety.* [4 entries, 1 absent.]

2901 I. (20*s.*)—MESDAMES HILL & MACONOCHIE, Tovil House, Maidstone. (Houdan.)
2903 II. (10*s.*)—SAMUEL WILLIAM THOMAS, Glasfryn, Forest Fach, Swansea. (Houdan.)
2902 R. N. & H. C.—PHILIP LEE, Wem, Salop. (Crèvecœur.)

Class 349.—*French Hens or Pullets, any other variety.* [4 entries, none absent.]

2907 I. (20*s.*)—SAMUEL WILLIAM THOMAS, Glasfryn, Forest Fach, Swansea. (Houdan.)
2905 II. (10*s.*)—MESDAMES HILL & MACONOCHIE, Tovil House, Maidstone. (Houdan.)
2906 R. N. & H. C.—PHILIP LEE, Wem, Salop. (Crèvecœur.)

Minorcas.

Class 350.—*Minorca Cocks.* [6 entries, none absent.]

2908 I. (20*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2911 II. (10*s.*)—ARTHUR GEORGE PITTS, Highbridge, Somerset.
2910 III. (5*s.*)—S. E. PARKER, 261 Green Lane, Birchills, Walsall.
2909 R. N. & H. C.—B. W. BONAS, Measham, Atherstone.

Class 351.—*Minorca Hens.* [9 entries, 1 absent.]

2919 I. (20*s.*), & 2920 III. (5*s.*)—ARTHUR GEORGE PITTS, Highbridge.
2918 II. (10*s.*)—WILLIAM HARTLEY, Yew Trees, Wennington, Lancaster.
2914 R. N. & H. C.—R. ANTHONY, Home Farm, Euxton, near Chorley.

Class 352.—*Minorca Cockerels.* [7 entries, none absent.]

2928 I. (20*s.*)—S. W. & A. STANLEY, 236 Highbury Vale, Bulwell, Notts.
2929 II. (10*s.*)—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.
2925 III. (5*s.*)—HENRY PINCHBECK, The Elms, Burton-on-Trent.
2927 R. N. & H. C.—WILLIAM SNELL, 129 High Street, Crediton.

Class 353.—*Minorca Pullets.* [6 entries, none absent.]

2934 I. (20*s.*)—S. W. & A. STANLEY, 236 Highbury Vale, Bulwell, Notts.
2932 II. (10*s.*)—HENRY PINCHBECK, The Elms, Burton-on-Trent.
2931 III. (5*s.*)—EDGAR A. HOWE, Stoke-by-Nayland, Colchester.
2933 R. N. & H. C.—WILLIAM SNELL, 129, High Street, Crediton.

Leghorns.

Class 354.—*White Leghorn Cocks or Cockerels.* [6 entries, 1 absent.]

2937 I. (20*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2941 II. (10*s.*)—G. TYRWHITT-DRAKE, Cobtree Farm, Sandling, Maidstone.
2936 R. N. & H. C.—ALLEN & DAFFERN, High Lea, Lickey, Bromsgrove.

Class 355.—*White Leghorn Hens or Pullets.* [12 entries, none absent.]

2944 I. (20*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2946 II. (10*s.*)—H. EVERED, Oatlands, Horley, Surrey.
2945 III. (5*s.*)—THOMAS BOWNASS, Biddenham, Bedford.
2947 R. N. & H. C.—D. MONTAGU-TURNOR, Halton, Holgate, Spilsby.

Class 356.—*Brown Leghorn Cocks or Cockerels.* [5 entries, 1 absent.]

2958 I. (20*s.*)—A. WIDD, Leghorn House, Earlestown, Lancs.
2954 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2957 R. N. & H. C.—L. C. VERREY, The Warren, Oxshott, Surrey.

Class 357.—*Brown Leghorn Hens or Pullets.* [7 entries, none absent.]

2965 I. (20*s.*)—R. HAY WILMOT, The Chase Farm, Ambergate.
2959 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2964 III. (5*s.*)—L. C. VERREY, The Warren, Oxshott, Surrey.
2960 R. N. & H. C.—MISSES ASHMALL & COOPER, Shenstone Court, Lichfield.

Class 358.—*Leghorn Cocks or Cockerels, any other colour.* [11 entries, 1 absent.]

2975 I. (20*s.*)—MRS. VERREY, The Warren, Oxshott, Surrey. (Duckwing.)
2976 II. (10*s.*)—LADY A. D. WILLOUGHBY, Normanton Park, Stamford. (Buff.)
2974 III. (5*s.*)—W. WILLIAM THOMPSON, Moresdale Hall, Kendal. (Buff.)
2973 R. N. & H. C.—BERT KIRKMAN, Fairfield, Ashford, Middlesex. (Black.)

Class 359.—*Leghorn Hens or Pullets, any other colour.* [11 entries, 3 absent.]

2984 I. (20*s.*)—W. WILLIAM THOMPSON, Moresdale Hall, Kendal. (Buff.)
2982 II. (10*s.*)—BERT KIRKMAN, Fairfield, Ashford, Middlesex. (Black.)
2983 III. (5*s.*)—L. H. & J. NUTTER, Burton, *viâ* Carnforth. (Pile.)
2985 R. N. & H. C.—G. TYRWHITT-DRAKE, Cobtree Farm, Sandling, Maidstone. (Duckwing.)

Anconas.

Class 360.—*Ancona Cocks or Cockerels.* [4 entries, none absent.]

2990 I. (20*s.*), & II. 2989 (10*s.*)—JOHN W. SYKES, Windsor House, Bury.
2991 R. N. & H. C.—H. E. H. WAY, Horspath, Wheatley, Oxon.

Class 361.—*Ancona Hens or Pullets.* [3 entries, none absent.]

2993 I. (20*s.*), & 2992 R. N. & H. C.—JOHN W. SYKES, Windsor House, Bury.

Andalusian.

Class 362.—*Andalusian Cocks or Cockerels.* [4 entries, 1 absent.]

2996 I. (20*s.*)—ROBERT LITTLE, JUN., Rokeby Cottage, Glossop.
2995 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
2998 R. N. & H. C.—MRS. G. M. SOAMES, Welton House, Daventry.

Class 363.—*Andalusian Hens or Pullets.* [3 entries.]

3000 I. (20*s.*) -ROBERT LITTLE, JUN., Rokeby Cottage, Glossop.
2999 II. (10*s.*)—R. ANTHONY, Home Farm, Euxton, near Chorley.
3001 R. N. & H. C.—MRS. G. M. SOAMES, Welton House, Daventry.

Table Fowls.

Class 364.—*Pairs of Cockerels, pure-breed.* [5 entries, none absent.]

3002 I. (20*s.*)—LAURENCE CURRIE, Minley Manor, Farnborough. (Dorking.)
3006 II. (10*s.*)—LADY ALICE STANLEY, Cowarth Park, Sunningdale. (Buff Orpington.)
3003 R. N. & H. C.—MRS. A. L. A. GREAVES, Haversham Fields, Wolverton, Bucks. (Buff Orpington.)

Class 365.—*Pairs of Pullets, pure-breed.* [6 entries, none absent.]

3009 I. (20*s.*)—HERBERT REEVES, Northlands, Emsworth. (Dorking.)
3007 II. (10*s.*)—THOMAS BRIDEN, Cononley, *viâ* Keighley. (Coloured Dorking.)
3011 III. (5*s.*)—LADY ALICE STANLEY, Cowarth Park, Sunningdale. (Buff Orpington.)
3010 R. N. & H. C.—LORD ROTHSCHILD, Tring Park, Herts. (Sussex.)

Class 366.—*Pairs of Cockerels, cross-breed.* [5 entries, 2 absent.]

3016 I. (20*s.*)—LADY ALICE STANLEY, Cowarth Park, Sunningdale. (Indian Game and Buff Orpington.)
3017 II. (10*s.*)—MRS. BRUCE WARD, Westwood Park, Droitwich. (Dorking and Buff Orpington.)
3013 R. N. & H. C.—LAURENCE CURRIE, Minley Manor, Farnborough. (Indian Game and Dorking.)

Class 367.—*Pairs of Pullets, cross-breed.* [5 entries, 1 absent.]

3020 I. (20*s.*)—WILLIAM HAMBLY, Cutlinwith, St. Germans. (Indian Game and Dorking.)
3018 II. (10*s.*)—LAURENCE CURRIE, Minley Manor, Farnborough. (Indian Game and Dorking.)
3022 R. N. & H. C.—LADY ALICE STANLEY, Cowarth Park, Sunningdale. (Indian Game and Buff Orpington.)

DUCKS.

Aylesbury.

Class 368.—*Aylesbury Drakes.* [7 entries, 3 absent.]

3028 I. (20*s.*)—FREDERICK READ, Aston Clinton, near Tring.
3027 II. 10*s.*)—EDWARD PENNINGTON, The Lagoon, Worcester Park, Surrey.
3029 III. (5*s.*)—W. N. WOOD, Upper Langwith, Mansfield.
3025 R. N. & H. C.—MRS. E. M. HINDE, Faircroft, Cobham, Surrey.

Class 369.—*Aylesbury Ducks.* [9 entries, 2 absent.]

3034 I. (20*s.*)—BENJAMIN HOLME, Hope, *viâ* Sheffield.
3037 II. (10*s.*)—FREDERICK READ, Aston Clinton, near Tring.
3033 III. (5*s.*)—MRS. E. M. HINDE, Faircroft, Cobham, Surrey.
3032 R. N. & H. C.—HARVEY FOSTER, Moorlands, Calver.

Class 370.—*Aylesbury Young Drakes.* [1 entry.]

3039 I. (20*s.*)—FREDERICK READ, Aston Clinton, near Tring.

Class 371.—*Aylesbury Ducklings.* [2 entries.]

3041 I. (20*s.*)—FREDERICK READ, Aston Clinton, near Tring.
3040 R. N. & H. C.—WILLIAM BYGOTT, Ryehill House, Ulceby.

Rouen.

Class 372.—*Rouen Drakes.* [4 entries, none absent.]

3043 I. (20*s.*)—WILLIAM BYGOTT, Ryehill House, Ulceby.
3044 II. (10*s.*)—A. T. & H. PEARS, Mere, near Lincoln.
3042 R. N. & H. C.—HENRY W. BELL, Caville Hall, Howden.

Class 373.—*Rouen Ducks.* [5 entries, none absent.]

3047 I. (20*s.*)—WILLIAM BYGOTT, Ryehill House, Ulceby.
3049 II. (10*s.*)—R. S. WILLIAMSON, The Grange, Hednesford.
3050 R. N. & H. C.—W. WOODS, Worksop.

Pekin.

Class 374.—*Pekin Drakes.* [5 entries, 3 absent.]

3054 I. (20*s.*)—PERCY PERCIVAL, Manor House, Berrow, Burnham.
3055 R. N. & H. C.—MRS. WHITTLE, Stokesley, R.S.O., Yorkshire.

Class 375.—*Pekin Ducks.* [4 entries, 3 absent.]

3059 I. (20*s.*)—PERCY PERCIVAL, Manor House, Berrow, Burnham.

Cayuga.

Class 376.—*Cayuga Drakes.* [3 entries, none absent.]

3061 I. (20*s.*)—R. S. WILLIAMSON, The Grange, Hednesford.
3060 R. N. & H. C.—EDWARD KENDRICK, Weeford House, Lichfield.

Class 377.—*Cayuga Ducks.* [2 entries.]

3064 I. (20*s.*)—R. S. WILLIAMSON, The Grange, Hednesford.
3063 R. N. & H. C.—EDWARD KENDRICK, Weeford House, Lichfield.

Indian Runners.

Class 378.—*Indian Runner Drakes.* [6 entries, none absent.]

3065 I. (20*s.*)—DURRETT BROTHERS, The Lawn, Tuffley, Glos.
3066 II. (10*s.*)—HENRY J. KINGWELL, Great Aish, South Brent.
3069 III. (5*s.*)—JACOB THOMLINSON, Tonford Manor, Canterbury.
3067 R. N. & H. C.—HENRY MAIDMENT, Hayton Gate, Low Row.

Class 379.—*Indian Runner Ducks.* [4 entries, 1 absent.]

3073 I. (20*s.*), & 3072 R. N. & H. C.—JACOB THOMLINSON, Tonford Manor, Canterbury
3071 II. (10*s.*)—DURRETT BROTHERS, The Lawn, Tuffley, Glos.

Geese.

Class 380.—*Embden Ganders.* [4 entries, none absent.]

3075 I. (30*s.*)—THE HON. SYBIL AMHERST, Didlington Hall, Stoke Ferry.
3076 II. (20*s.*)—JAMES & WALTER BIRCH, Edge Farm, Sefton.
3077 R. N. & H. C.—WILLIAM BYGOTT, Ryehill House, Ulceby.

Class 381.—*Embden Geese.* [5 entries, none absent.]

3080 I. (30*s.*)—JAMES & WALTER BIRCH, Edge Farm, Sefton.
3081 II. (20*s.*)—RICHARD BOOTH, Warlaby, Northallerton.
3082 R. N. & H. C.—WILLIAM BYGOTT, Ryehill House, Ulceby.

Class 382.—*Toulouse Ganders.* [4 entries, none absent.]

3085 **I.** (30*s.*)—WILLIAM BYGOTT, Ryehill House, Ulceby.
3084 **II.** (20*s.*)—THOMAS ALTHAM, Clifton Arms, Little Marton, Blackpool.
3086 **R. N. & H. C.**—FRED W. TROUP, Denmark Cottage, Southwater.

Class 383.—*Toulouse Geese.* [3 entries, none absent.]

3090 **I.** (30*s.*)—W. WOODS, Worksop.
3088 **R. N. & H. C.**—WILLIAM BYGOTT, Ryehill House, Ulceby.

Turkeys.

Class 384.—*Turkey Cocks.* [9 entries, 1 absent.]

3092 **I.** (30*s.*)—A. GOODWIN, Partney Mill, Spilsby. (Bronze.)
3099 **II.** (20*s.*)—W. WOODS, Worksop. (American Bronze.)
3097 **III.** (10*s.*)—LADY A. D. WILLOUGHBY, Normanton Park, Stamford. (American Bronze.)
3093 **R. N. & H. C.**—F. H. JENNINGS, Cockfield Hall, Bury St. Edmunds. (Mammoth Bronze.)

Class 385.—*Turkey Hens.* [7 entries, 3 absent.]

3103 **I.** (30*s.*)—F. H. JENNINGS, Cockfield Hall, Bury St. Edmunds. (Mammoth Bronze.)
3104 **II.** (20*s.*)—EDWARD KENDRICK, Weeford House, Lichfield. (Bronze.)
3100 **III.** (10*s.*)—RICHARD BACH, White House, Onibury. (Bronze.)
3105 **R. N. & H. C.**—LORD ROTHSCHILD, Tring Park, Herts. (American Bronze.)

Breeding Pens.

Class 386.—*Indian Game.* [7 entries, 2 absent.]

3111 **I.** (30*s.*)—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch.
3107 **II.** (20*s.*)—BERESFORD & TAYLOR, Derwent Poultry Farm, Belper.
3109 **III.** (10*s.*)—WILLIAM BRENT, Clampit Farm, Callington.
3110 **R. N. & H. C.**—FIRTH BROTHERS, Wharton Farm, Acton Vale, W.

Class 387.—*Game, any other variety.* [4 entries, none absent.]

3115 **I.** (30*s.*)—HARRY S. HASSALL, The Cedars, Ashby-de-la-Zouch. (Old English.)
3114 **II.** (20*s.*)—CYRIL BOULTER, Godstone, Surrey. (Old English.)
3116 **R. N. & H. C.**—ROBERT PASHLEY, The Kerne Lodge, Ross. (Old English Duckwing.)

Class 388.—*Dorking, any variety.* [3 entries, 2 absent.]

3119 **I.** (30*s.*)—HERBERT REEVES, Northlands, Emsworth. (Silver Grey.)

Class 389.—*Plymouth Rock.* [1 entry.]

3121 **I.** (30*s.*)—FRANK NEAVE, Lingwood, Norwich.

Class 390.—*Wyandottes, any variety.* [4 entries, none absent.]

3122 **I.** (30*s.*)—O. F. BATES, Harlow Court, Harrogate. (Silver.)
3123 **II.** (20*s.*)—CHARLES W. DUNN, Mosley Farm, Rolleston. (White.)
3125 **R. N. & H. C.**—COL. S. SANDBACH, Hafodunos, Abergele. (Partridge.)

Class 391.—*Orpington, any variety.* [2 entries.]

3126 **I.** (30*s.*)—W. COOK & SONS, Orpington House, St. Mary Cray. (Black.)
3127 **R. N. & H. C.**—REV. J. B. NODDER, Ashover Rectory, Chesterfield. (Buff.)

Class 392.—*Minorca.* [2 entries.]

3129 **I.** (30*s.*)—HERBERT STURCH, Stawell Lodge, Richmond, Surrey.
3128 **R. N. & H. C.**—T. F. HORSLEY, South Grove, Highgate.

Class 393.—*Leghorn, any variety.* [1 entry.]

3130 **I.** (30*s.*)—T. BELLAMY DALE, Hurst Lodge, Tibshelf, Alfreton. (White.)

FARM AND DAIRY PRODUCE OF THE UNITED KINGDOM.

Butter.

Class 394.—*Boxes of Twelve 2-lb. Rolls of Butter, made with not more than 1 per cent. of salt.* [15 entries, none absent.]

3142 I. (£4.)—SIR CHARLES SEELY, BT., Brook Farm, Brook, Isle of Wight.
3141 II. (£2.)—MISS MABEL G. PRIDEAUX, The Grange, Motcombe, Dorset.
3137 III. (£1.)—ALBERT F. HURT, Alderwasley Hall, Matlock Bath.
3138 R. N. & H. C.—MISS C. LEWIS, Hanton Farm, Haverfordwest.

Class 395.—*Two Pounds Fresh Butter, slightly salted, made up in Pounds.* [59 entries, 6 absent.]

3150 (£2.)—MRS. I. BAINES, West End Farm, Henfield, Sussex.
3177 (£2.)—MRS. L. R. MILDON, Higher Mead Down, Rackenford, Morchard Bishop.
3199 (£2.)—R. UNDERWOOD, Wards Coombe, Little Gaddesden, Gt. Berkhampstead.
3203 (£2.)—MRS. FRANK WARD, Burnville, Brenton, Tavistock.
3153 (£1.)—MRS. A. A. BERE, Emmerford, Cove, near Tiverton.
3186 (£1.)—MRS. E. DICKSON PARK, Sedgemoor, Loudwater, Bucks.
3187 (£1.)—THE HON. E. W. B. PORTMAN, Hestercombe, Taunton.
3196 (£1.)—LADY SMYTH, Ashton Court, Bristol.
3147 (10*s*.)—THE EARL OF ANCASTER, Normanton Park, Stamford.
3156 (10*s*.)—LADY DE ROTHSCHILD, Aston Clinton, Tring.
3182 (10*s*.)—THE EARL OF MOUNT-EDGCUMBE, Mount Edgcumbe, Plymouth.
3191 (10*s*.)—LORD ROTHSCHILD, Tring Park, Herts.
3195 R. N. & H. C.—MRS. SMITH-NEILL, Wendover Lodge, Wendover, Bucks.

Cream.

Class 396.—*One Dozen ¼-Pint Jars.*[1] [13 entries, none absent.]

3216 I. (£3.)—W. SPALTON, The Creameries, King Street, Derby.
3214 II. (£2.)—MISS MABEL G. PRIDEAUX, The Grange, Motcombe, Dorset.
3217 III. (£1.)—W. H. WILLIAMSON, 26 and 28 Bridge Gate, Derby.
3205 R. N. & H. C.—BALLYRASHANE CO-OPERATIVE AGRICULTURAL AND DAIRY SOCIETY, LTD., Ballyrashane, Coleraine, Belfast.

Cheese.

Made in 1906.

Class 397.—*Three Cheddar Cheeses, of not less than 50 lb. each.* [16 entries, 1 absent.]

3229 I. (£5.)—W. C. SPENCER, North Perrott, Crewkerne, Somerset.
3228 II. (£3.)—N. J. SIMS, Pitcombe, Bruton, Somerset.
3221 III. (£2.)—ALEXANDER CROSS, Knockdon, Maybole, Ayrshire.
3224 IV. (£1.)—WILLIAM HUNTER, Garthland Mains, Stranraer.
3230 R. N. & H. C.—ROBERT STEVENSON, Boghead, Galston, Ayrshire.

Class 398.—*Three Cheshire Cheeses, of not less than 40 lb. each.* [18 entries, 1 absent.]

3244 I. (£5.)—W. H. HOBSON, Blakenhall, Nantwich.
3247 II. (£3.)—MRS. M. A. NUNNERLEY, Bradeley Green, Whitchurch, Salop.
3238 III. (£2.)—S. CHARLESWORTH, Red Hall, Leighton, Crewe.
3248 IV. (£1.)—MRS. EMMA SIMPSON, Tiverton Hall, Tarporley.
3240 R. N. & H. C.—WILLIAM DUTTON, Brindley Hall, Nantwich.

Class 399.—*Three Stilton Cheeses.* [11 entries, 1 absent.]

3254 I. (£4.)—ALBERT HULL, Frisby House, Billesdon, Leicester.
3260 II. (£3.)—JOHN SMITH, Gaddesby, Leicester.
3256 III. (£1.)—W. MILLER, Cherry Tree Farm, Plungar, Bottesford, Notts.
3258 R. N. & H. C.—HENRY MORRIS, Manor Farm, Saxelby, Melton Mowbray.

Class 400.—*Three Wensleydale Cheeses (Stilton Shape).* [4 entries, none absent.]

3263 I. (£4.)—A. HARKER, Carperby, S.O., Yorks.
3266 II. (£3.)—MRS. WILLIS, Manor House, Carperby, S.O., Yorks.

[1] Prizes given by the Derby Local Committee.

Class 401.—*Three Double Gloucester Cheeses.* [10 entries, none absent.]

3272 **I.** (£4.)—HISCOCK & CO., Stourton Farm, Stourton, Bath.
3276 **II.** (£3.)—N. J. SIMS, Pitcombe, Bruton, Somerset.
3267 **III.** (£1.)—CROXDEN DAIRY ASSOCIATION, Croxden, Rocester, Stafford.

Class 402.—*Three Cheddar Truckle Cheeses.* [16 entries, none absent.]

3288 **I.** (£3.)—ROBERT STEVENSON, Boghead, Galston, Ayrshire.
3280 **II.** (£2.)—ALEXANDER CROSS, Knockdon, Maybole, Ayrshire.
3279 **III.** (£1.)—CARY & PORTCH, Redlynch Park Farm, Bruton, Somerset.
3287 **R. N. & H. C.**—W. C. SPENCER, North Perrott, Crewkerne, Somerset.

Class 403.—*Three Staffordshire or Derbyshire Cheeses.* [8 entries, 1 absent.]

3297 **I.** (£3.)—GRATTON FARMERS' ASSOCIATION, Gratton, Winster, Matlock.
3300 **II.** (£2.)—MAYFIELD DAIRY ASSOCIATION, Mayfield, Ashbourne.
3295 **III.** (£1.)—J. W. FOWLER, Donisthorpe, Ashby-de-la-Zouch.

Class 404.—*Six Pure Cream Cheeses, 8 oz. each.*[1]
[12 entries, none absent.]

3305 **I.** (£3.)—F. W. GILBERT & CO., Cuttle Bridge Creamery, Swarkestone, near Derby.
3302 **II.** (£2.)—LADY DE ROTHSCHILD, Aston Clinton, Tring.
3303 **III.** (£1.)—EGGINTON DAIRY CO., LTD., Egginton Junction, Etwall, near Derby.
3307 **R. N. & H. C.**—MRS. A. MILNER, JUN., Top Farm, Stretton, near Alfreton.

Cider and Perry.

N.B.—The names of the Fruits from which the Cider or Perry is stated by the Exhibitor to have been made are added after the address of the Exhibitor. In Classes 407 and 408 the date of making is also given.

Class 405.—*Casks of Cider, of not less than 18, and not more than 30 gallons, made in the autumn of 1905.* [18 entries, none absent.]

3317 **I.** (£5.)—D. J. CROFTS & SON, Sutton Montis, Sparkford, Somerset. (Royal and White Jersey, White Close Pippin, and Kingston Black.)
3316 **II.** (£3.)—JOHN BAZLEY, The Bury, Stoke Prior, Leominster. (White Norman and Fox Whelp.)
3326 **III.** (£2).—THOMAS STONE, Axe Vale Cider Works, Axminster. (Kingston Black Pound and others.)
3330 **R. N. & H. C.**—WATERMAN & SON, Baltonsborough, Somerset. (Cap of Liberty Red and King Jersey, Fox Whelp, and Kingston Black.)

Class 406.—*One Dozen Bottles of Cider, made in the autumn of 1905.*
[26 entries, none absent.]

3349 **I.** (£5.)—JAMES SLATTER & CO., Paxford, Campden. (Kingston Black.)
3347 **II.** (£3.)—RIDLER & SON, Clehonger Manor, Hereford. (Fox Whelp.)
3333 **III.** (£2.)—JOHN BAZLEY, The Bury, Stoke Prior, Leominster. (Fox Whelp and Red Norman.)
3334 **R. N. & H. C.**—JOHN BAZLEY. (Cummy Norman.)

Class 407.—*One Dozen Bottles of Cider, made in any year before 1905.*
[13 entries, none absent.]

3367 **I.** (£5.)—THOMAS STONE, Axe Vale Cider Works, Axminster. (Pound and others, 1904.)
3358 **II.** (£3.)—JOHN BAZLEY, The Bury, Stoke Prior, Leominster. (Fox Whelp and White Norman, 1902.)
3369 **III.** (£2.)—TILLEY BROTHERS, Shepton Mallet. (Fox Whelp, Kingston Black, and Royal Jersey, 1904.)
3360 **R. N. & H. C.**—JOHN BAZLEY. (Fox Whelp and Royal Wilding, 1900.)

Class 408.—*One Dozen Bottles of Perry.* [8 entries, none absent.]

3377 **I.** (£5.)—HENRY THOMSON, Southends, Newent. (Oldfield, 1905.)
3371 **II.** (£3.)—EARDISTON FARMING CO., LTD., Eardiston, Tenbury. (Moorcroft, 1905.)
3370 **III.** (£2.)—EARDISTON FARMING CO., LTD. (Oldfield, 1904.)
3376 **R. N. & H. C.**—JAMES SLATTER & CO., Paxford, Campden. (Oldfield, 1905.)

Wool.

Of 1906 Clip.

Class 409.—*Three Fleeces of Leicester or Border Leicester Wool.*
[5 entries, none absent.]

3379 **I.** (£3), & 3378 **II.** (£2.)—GEORGE HARRISON, Gainford Hall, Darlington. (Leicester Hogs.)
3380 **R. N. & H. C.**—TOM LEATHES, Wern Fawr, Ruthin. (Border Leicester Yearling Gimmers.)

[1] Prizes given by the Derby Local Committee.

Class 410.—*Three Fleeces of Lincoln Wool.* [5 entries, none absent.]

3383 **I.** (£3), & 3384 **R. N. & H. C.**—HENRY DUDDING, Riby Grove, Great Grimsby. (Hogs.)
3385 **II.** (£2.)—W. B. SWALLOW, Wootton Lawn, Ulceby. (Yearling Hogs.)

Class 411.—*Three Fleeces of Kent or Romney Marsh Wool.* [9 entries, none absent.]

3395 **I.** (£3.)—HENRY RIGDEN, Etchinghill, Lyminge, S.O., Kent. (Two-Year-Old Wethers.)
3390 **II.** (£2.)—CHARLES FILE, Elham, Canterbury. (Yearlings.)
3392 **III.** (£1.)—FREDERICK NEAME, Macknade, Faversham. (Wethers.)

Class 412.—*Three Fleeces of any other Long Wool.* [8 entries, none absent.]

3404 **I.** (£3.)—THE EXORS. OF THE LATE T. WILLIS, Manor House, Carperby, S.O. (Wensleydale Hogs.)
3400 **II.** (£2.)—A. C. SKINNER, Pound Farm, Bishop's Lydeard. (Devon Yearling Ewes.)
3398 **III.** (£1.)—WILLIAM HOULTON, Broadfield Farm, Northleach. (Cotswold Yearling Ewes.)

Class 413.—*Three Fleeces of Southdown Wool.* [6 entries, 1 absent.]

3407 **I.** (£3.)—WILLIAM DOCKERAY, Park House, Westwell, Ashford, Kent. (Ewes.)
3410 **II.** (£2.)—THE DUKE OF RICHMOND AND GORDON, K.G., Goodwood, Chichester. (Yearling Hogs.)
3405 **III.** (£1.)—LORD CALTHORPE, Elvetham Park, Winchfield. (Yearling Ewes.)

Class 414.—*Three Fleeces of Shropshire Wool.* [6 entries, none absent.]

3411 **I.** (£3), & 3412 **III.** (£1.)—RICHARD BACH, White House, Onibury, Salop. (Yearling Hogs.)
3414 **II.** (£2.)—W. GIBBS & SON, Brund House, Kirk Langley, Derby. (Yearling Ewes.)

Class 415.—*Three Fleeces of any other Short Wool.* [9 entries, none absent.]

3420 **I.** (£3.)—W. R. FLOWER, West Stafford, Dorchester. (Dorset Horn Yearling Hogs.)
3425 **II.** (£2.)—DAVID J. THOMAS, Wainmynich, Brecon. (Ryeland Yearling Rams.)
3417 **III.** (£1.)—W. H. DAVIES, Claston, Dormington, Hereford. (Ryeland Yearling Hogs.)

Class 416.—*Three Fleeces of Welsh Wool.* [5 entries, 1 absent.]

3430 **I.** (£3.)—MRS. WYNNE-FINCH, Vœlas, Bettws-y-coed. (Ewes.)
3428 **II.** (£2.)—TOM LEATHES, Wern Fawr, Ruthin. (Yearlings.)

Class 417.—*Three Fleeces of Scotch Wool.* [8 entries, 1 absent.]

3432 **I.** (£3.)—JOHN DARGUE, Burneside Hall, Kendal. (Cheviot Hogs.)
3433 **II.** (£2.)—JOHN DOWSON, Danby Castle, Grosmont, York. (Black-faced Ewes.)
3438 **III.** (£1.)—JOHN ROBSON, Newton, Bellingham. (Black-faced Yearlings.)

HIVES, HONEY, AND BEE APPLIANCES.[1]

Class 418.—*Collections of Hives and Appliances.* [6 entries.]

3441 **I.** (£4.)—W. P. MEADOWS, Syston, Leicester.
3439 **II.** (£2.)—ABBOTT BROTHERS, High Street, Southall.
3444 **III.** (£1.)—E. H. TAYLOR, Welwyn, Herts.
3443 **R. N. & H. C.**—W. SHEPHERD, Higher Broughton, Manchester.

Class 419.—*Frame Hives, for general use, unpainted.* [14 entries.]

3446 **I.** (20*s.*)—ABBOTT BROTHERS, High Street, Southall.
3457 **II.** (15*s.*)—SAMUEL P. SOAL, Reliable Bee Farm, Rochford, Essex.
3450 **III.** (10*s.*)—W. P. MEADOWS, Syston, Leicester.
3453 **R. N. & H. C.**—GEORGE ROSE, 50 Great Charlotte Street, Liverpool.

Class 420.—*Frame Hives, for Cottager's use, unpainted.* [7 entries.]

3465 **I.** (20*s.*)—E. H. TAYLOR, Welwyn, Herts.
3464 **II.** (15*s.*)—SAMUEL P. SOAL, Reliable Bee Farm, Rochford.
3461 **III.** (10*s.*)—JAMES LEE & SON, 4 Martineau Road, Highbury, N.
3459 **R. N. & H. C.**—ABBOTT BROTHERS, High Street, Southall.

Class 421.—*Honey Extractors.*[2] [5 entries.]

3469 **I.** (15*s.*), & 3467 **II.** (10*s.*)—W. P. MEADOWS, Syston, Leicester.
3466 **R. N. & H. C.**—JAMES LEE & SON, 4 Martineau Road, Highbury, N.

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[1] Prizes given by the British Bee-keepers' Association.
[2] Prizes given by Mr. T. W. Cowan.

Class 422.—*Observatory Hives, not exceeding three Frames, and Bees with Queen.* [10 entries.]

3475A **I.** (20*s.*)—J. PEARMAN, Penny Long Lane, Derby.
3471 **II.** (15*s.*)—JAMES BAKEWELL, 256 Goodman Street, Burton-on-Trent.
3472 **III.** (10*s.*)—WILLIAM DIXON, 5 Beckett Street, Leeds.
3473 **R. N. & H. C.**—SYDNEY DUROSE, 74 South Broadway Street, Burton-on-Trent.

Class 423.—*Any appliance connected with Bee-keeping, to which no prize has been awarded at a Show of the R.A.S.E.* [6 entries.]

(No Award.)

Class 424.—*Comb Honey.*[1] [13 entries.]

3488 **I.** (20*s.*)—G. W. BUTTERY, Wheaton Aston, near Stafford.
3496 **II.** (15*s.*)—J. PEARMAN, Penny Long Lane, Derby.
3497 **III.** (10*s.*)—JOHN STONE, Little Cubley, Sudbury, Derbyshire.
3491 **R. N. & H. C.**—JOHN HELME, Norton Canon, Weobley, S.O.

Class 425.—*Run or Extracted Light-coloured Honey.* [21 entries.]

3511 **I.** (20*s.*)—T. S. HOLDSWORTH, Woodford House, Kirton Lindsey.
3500 **II.** (15*s.*)—JOB ASTBURY, York Villas, Kelsall, near Chester.
3516 **III.** (10*s.*)—R. MORGAN, The Apiary, Cowbridge.
3515 **R. N. & H. C.**—JAMES LEE & SON, 4, Martineau Road, Highbury, N.

Class 426.—*Run or Extracted Medium or Dark-coloured Honey.* [12 entries.]

3521 **I.** (20*s.*)—JOSEPH BOYES, Queen's Head Hotel, Cardiff.
3526 **II.** (15*s.*)—JOHN HELME, Norton Canon, Weobley, S.O.
3522 **III.** (10*s.*)—THE REV. G. C. BRUTON, Great Haywood Vicarage, Stafford.
3520 **R. N. & H. C.**—W. H. BIRD, 10 Main Street, Stapenhill, Burton-on-Trent.

Class 427.—*Granulated Honey.* [18 entries.]

3548 **I.** (20*s.*)—F. F. UPTON, 73 Church Street, Rugeley, Staffs.
3533 **II.** (15*s.*)—W. H. BIRD, 10 Main Street, Stapenhill, Burton-on-Trent.
3537 **III.** (10*s.*)—SYDNEY DUROSE, 74 South Broadway Street, Burton-on-Trent.
3547 **R. N. & H. C.**—JOHN STONE, Little Cubley, Sudbury, Derbyshire.

Class 428.—*Comb Honey.*[2] [10 entries.]

3555 **I.** (20*s.*)—CHARLES LODGE, High Easter, Chelmsford.
3558 **II.** (15*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3550 **III.** (10*s.*)—RICHARD BROWN, Flora Apiary, Somersham, Hunts.
3559 **R. N. & H. C.**—W. WOODLEY, Beedon, Newbury.

Class 429.—*Run or Extracted Light-coloured Honey.* [10 entries.]

3566 **I.** (20*s.*)—CHARLES LODGE, High Easter, Chelmsford.
3564 **II.** 15*s.*)—DAVID HANCOX, Deddington, Oxon.
3568 **III.** (10*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3567 **R. N. & H. C.**—W. P. MEADOWS, Syston, Leicester.

Class 430.—*Run or Extracted Medium or Dark-coloured Honey.* [5 entries.]

3574 **I.** (20*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3572 **II.** (15*s.*)—FREDERICK J. OLD, Chapel Place, Piddington, Northampton.
3570 **III.** (10*s.*)—RICHARD BROWN, Flora Apiary, Somersham, Hunts.
3571 **R. N. & H. C.**—JESSE GARRATT, Meopham, Kent.

Class 431.—*Granulated Honey.* [9 entries.]

3575 **I.** (20*s.*)—JAMES BARNES, Ivy Apiary, Burwell, Cambs.
3583 **II.** (15*s.*)—W. WOODLEY, Beedon, Newbury.
3579 **III.** (10*s.*)—CHARLES LODGE, High Easter, Chelmsford.
3578 **R. N. &. H. C.**—F. R. FORD, County Apiary, Burwell, Cambs.

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[1] Entries in Classes 424-427 limited to Bee-keepers resident in Cheshire, Cumberland, Derbyshire, Durham, Herefordshire, Lancashire, Leicestershire, Lincolnshire, Monmouthshire, Northumberland, Nottinghamshire, Rutland, Shropshire, Staffordshire, Warwickshire, Westmorland, Worcestershire, Yorkshire, the Isle of Man, Ireland, Scotland, or Wales.

[2] Entries in Classes 428-431 are limited to Bee-keepers resident in Bedfordshire, Berkshire, Bucks., Cambridgeshire, Cornwall, Devon, Dorset, Essex, Gloucestershire, Hampshire, Herts., Hunts., Isle of Wight, Kent, Middlesex, Norfolk, Northamptonshire, Oxfordshire, Somerset, Suffolk, Surrey, Sussex, or Wiltshire.

Class 432.—*Frames of Comb Honey, for Extracting.* [7 entries.]

3589 I. (20*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3585 II. (15*s.*)—RICHARD BROWN, Flora Apiary, Somersham, Hunts.
3590 III. (10*s.*)—JAMES E. WILLIAMS, Bunns Lane Farm, Moorhampton, Hereford.

Class 433.—*Heather Honey.* [10 entries.]

3591 I. (20*s.*)—JOHN BERRY, The Apiary, Llanrwst, North Wales.
3599 II. (15*s.*)—THOMAS WALKER, Hawksbead, Lancashire.
3600 III. (10*s.*)—W. A. WOODS, The Firs Apiary, Normandy, near Guildford.
3598 **R. N. & H. C.**—WALDEN BROS., 38 Kenilworth Avenue, Wimbledon, S.W.

Class 434.—*Heather Mixture Extracted Honey.* [14 entries.]

3602 I. (20*s.*)—W. E. BROOKING, Malborough, near Kingsbridge, South Devon.
3612 II. (15*s.*)—F. F. UPTON, 73 Church Street, Rugeley, Staffs.
3609 III. (10*s.*)—A. G. PUGH, Beech House, Queen's Road, Beeston, Notts.
3601 **R. N. & H. C.**—EDWARD P. BETTS, Hill House, Camberley, Surrey.

Class 435.—*Best and Most Attractive Displays of Honey.* [10 entries.]

3622 I. (30*s.*)—J. PEARMAN, Penny Long Lane, Derby.
3615 II. (20*s.*)—W. H. BIRD, 10 Main Street, Stapenhill, Burton-on-Trent.
3620 III. (10*s.*)—SYDNEY DUROSE, 74 South Broadway Street, Burton-on-Trent.
3621 **R. N. & H. C.**—GRAY & BALL, The Apiary, Eagle Hall, near Lincoln.

Class 436.—*Exhibits of not less than 2 lb. of Wax, the Produce of the Exhibitor's Apiary.* [10 entries.]

3633 I. (10*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3626 II. (7*s.* 6*d.*)—RICHARD BROWN, Flora Apiary, Somersham, Hunts.
3629 III. (5*s.*)—CHARLES LODGE, High Easter, Chelmsford.
3634 **R. N. & H. C.**—MRS. H. H. WOOSNAM, Hayton, Newton Abbot, Devon.

Class 437.—*Exhibits of not less than 3 lb. of Wax, the Produce of the Exhibitor's Apiary.* [5 entries.]

3639 I. (10*s.*)—E. C. R. WHITE, Newton Toney, near Salisbury.
3638 II. (7*s.* 6*d.*)—J. PEARMAN, Penny Long Lane, Derby.
3635 III. (5*s.*)—JOHN BERRY, The Apiary, Llanrwst, North Wales.
3636 **R. N. & H. C.**—F. W. FRUSHER, Swiss Apiary, New Town, Crowland, Peterborough.

Class 438.—*Half-gallons of Honey Vinegar.* [5 entries.]

3640 I. (7*s.* 6*d.*)—JOSEPH GRAY, The White Apiary, Eagle Hall, Lincoln.

Class 439.—*Half-gallons of Mead.* [3 entries.]

3646 I. (7*s.* 6*d.*)—T. H. GEARY, King Street, Enderby, Leicester.

Class 440.—*Exhibits of a practical or interesting nature connected with Bee-culture, not mentioned in the foregoing Classes.*

3650 I. (10*s.*)—F. W. L. SLADEN, Ripple Court Apiary, near Dover. (Queen rearing apparatus.)
3648 **Certificate of Merit.**—WILLIAM DIXON, 5 Beckett Street, Leeds. (Honey Toilet Cream.)
3649 **R. N. & H. C.**—JOSEPH GRAY, The White Apiary, Long Eaton, Derbyshire (Throat Mixture and Voice Jubes.)

Class 441.—*Exhibits of a scientific nature, not mentioned in the foregoing Classes, to which no prize has been awarded at a Show of the R.A.S.E.*

3654 I. (10*s.*)—GEORGE HAYES, 48 Mona Street, Beeston, Notts. (A Nature Study of the Honey Bee.)
3655 **Certificate of Merit.**—GEORGE ROSE, 50 Great Charlotte Street, Liverpool. (Lantern Slides and Bee Books.)
3651 **R. N. & H. C.**—JOHN CARVER, Victoria Avenue, Wellington, Salop. (Appliance for the Rapid Glazing of Sections.)

HORSE-SHOEING COMPETITIONS.

Class 1.—*Hunters.* [33 entries, none absent.]

3 I. (£3 10*s.*)—GEORGE WILLIAM BENNETT, R.S.S., Lillingstone Dayrell, Buckingham.
9 II. (£2.)—DAVID DAVIES, R.S.S., Peterwell Forge, Lampeter.
12 III. (£1 10*s.*)—WILLIAM MORGAN, Cwmpêr, Llanarthney, Carmarthen.
20 IV. (£1.)—HERBERT MORGAN, Cwmpêr, Llanarthney, Carmarthen.
17 **R. N. & H. C.**—THOMAS KERR, R.S.S., Whitchurch Hill, Oxon.

Class 2.—*Cart Horses.* [49 entries, none absent.]

58 **I.** (£3 10*s.*)—TIMOTHY JONES, R.S.S., Peterwell Forge, Lampeter.
78 **II.** (£2.)—J. WALTERS, Urquharts Forge, 6 Derby Street, Park Lane, London, W.
61 **III** (£1 10*s.*)—THOMAS BENJAMIN LEWIS, R.S.S., Cambrian Forge, Aberystwyth.
66 **IV.** (£1.)—THOMAS PRICE, Penybont, Radnorshire.
48 **R. N. & H. C.**—JOHN THOMAS GASCOIGNE, R.S.S., Moreton Pinkney, Byfield.

JUMPING COMPETITIONS.[1]

(The Entry Fees received in Classes C and E were divided equally among the prize winners in each Class, in augmentation of the prizes.)

Class A.—*Mares or Geldings*, 15 *hands* 2 *inches and over.* [16 entries.]

8 **I.** (£20.)—GEORGE LEDSON, Bromborough, Birkenhead, for **Pioneer.**
2 **II.** (£15.)—WHITTINGHAM BROS., Wellington Street, Burton-on-Trent, for **Starlight,** bay gelding.
9 **III.** (£10.)—F. W. FOSTER, Culland, Brailsford, Derby, for **Paddy,** bay gelding.
5 **R. N. & H. C.**—TOM SMITH, The Red House, Worcester, for **Kangaroo,** bay gelding.

Class B.—*Mares or Geldings, above* 14 *hands* 2 *inches and under* 15 *hands* 2 *inches.* [8 entries.]

3 **I.** (£20.)—F. VOLLER GRANGE, Oak House, Farndon, for **Rufus,** chestnut gelding.
7 **II.** (£15.)—THOMAS GLENCROSS, Garth, Frome, for **Blink Bonny,** bay mare.
1 **III.** (£10.)— F. W. FOSTER, Culland, Brailsford, Derby, for **Gay Lass,** bay mare.
6 **R. N. & H. C.**—W. FAVELL, 1 Meadow Street, Sheffield, for **Kelveno,** brown mare.

Class C.—*Unsuccessful Competitors in Classes A and B.* [14 entries.]

20 **I.** (£10.)—F. & E. MERRETT, Green Farm, Hardwicke, Gloucester, for **Snowdrop** grey gelding.
19 **II.** (£5.)—S. G. BROMLEY, Walcot, Wellington, Salop, for **Old Sport,** bay gelding.
9 **III.** (£3.)—F. VOLLER GRANGE, Oak House, Farndon, Cheshire, for **Hardcash.** black gelding.
16 **R. N. & H. C.**—WALTER W. GRUNDY, 30 Broad Street, Worcester, for **Finstall.**

Class D.—*Pony Mares or Geldings*, 14 *hands* 2 *inches and under.* [12 entries.]

10 **I.** (£20.)—THOMAS GLENCROSS, Garth, Frome, for **Bampton,** bay gelding.
6 **II.** (£10.)—WALTER W. GRUNDY, 30 Broad Street, Worcester, for **Stratford Lass,** black mare.
3 **III.** (£5.)—WHITTINGHAM BROS., Wellington Street, Burton-on-Trent, for **Snow drop,** grey mare.
1 **R. N. & H. C.**—F. VOLLER GRANGE, Oak House, Farndon, Cheshire, for **Grey Bird.**

Class E.—*Unsuccessful Competitors in Class D.* [6 entries.]

4 **I.** (£10.)—RICHARD TUGWELL, Church Street, Tetbury, for **Dainty,** brown mare.
1 **II.** (£5.)—F. VOLLER GRANGE, Oak House, Farndon, for **Grey Bird,** grey gelding.
12 **III.** (£2.)—MRS. WINIFRED M. SIMS, Burrowfield Lodge, Borrowash, Derby, for **Sparrow,** brown mare.
7 **R. N. & H. C.**—WHITTINGHAM BROS., Wellington Street, Burton-on-Trent, for **Dainty,** black mare.

IMPLEMENTS.

Gas Engines and Suction Gas Plants.

No. in Implement Catalogue

7 **Gold Medal.**—THE NATIONAL GAS ENGINE CO., LTD., Ashton-under-Lyne, for 20 B.H.P. "National" Gas Engine, with Electric Ignition, and 20 B.H.P. "National" Suction Gas Plant. £233.
31 **Silver Medal.**—CROSSLEY BROS., Openshaw, Manchester, for 15 B.H.P. Gas Engine, with 15 B.H.P. Suction Gas Plant. Patent type for small powers. £180.

Miscellaneous Implements.

Silver Medals for articles entered as "New Implements for Agricultural or Estate Purposes."

105 H. P. SAUNDERSON & CO., LTD., Elstow Works, Bedford, for 30 B.H.P. Universal Motor.
1274 WM. EDDINGTON & CO., Plaistow, London, E., for Section Remover.

[1] Prizes given by the Derby Local Committee.

LOCAL CLASSES.[1]

Open only to bonâ fide Tenant Farmers, Members of the Derbyshire Agricultural Society, residing within the local area.

CATTLE.

Class 1.—*Bulls*, 2 *years old, and under* 5.

6 **I.** (£6, & **Champion.**[2])—P. WALKER, Parkfield Farm, Shipley, Ilkeston, for **Lord Florence**, roan, 2 years 9 months, bred by Mrs. L. H. Holland; *s.* Cherrystone 80671, *d.* Lady Florence (vol. 50, p. 652) *by* Recorder 75372.

1 **II.** (£3.)—A. HOLDEN, The Stud Farm, Chevin, Belper, Derby, for **Lord Bruce II.** 86421, roan, 2 years 9 months, bred by R. Smedley, Pentrich; *s.* Lord Bruce 79237, *d.* Lady Alex *by* Hopeful King 67200.

2 **R. N. & H. C.**—JOHN G. SHIELDS, Isley Walton, Derby, for **Prince of Latton 9th.**

Class 2.—*Bulls, above* 1, *and not exceeding* 2 *years old.*

9 **I.** (£6.)—RICHARD WARD, Old Hall Farm, Swanwick, Alfreton, for **Newland's Pride,** roan, bred by Messrs. Oakes & Co., Riddings Farm, Alfreton; *s.* Chedglow Pride 2nd, *d.* Rose of Chedglow (vol. 47, p. 313) *by* Prince William 67676.

8 **II.** (£3.)—J. F. WALKER, White House, Ripley, Derby, for **Victor Chief,** roan, 1 year 11 months 3 weeks 6 days; *s.* Arrow, *d.* Dairy Cow.

13 **R. N. & H. C.**—P. WALKER, Shipley, Ilkeston, for **Duke of Hazlecote 124th.**

Class 3.—*Three Cows*, 3 *years old or upwards, best adapted for Dairy purposes.*

17 **I.** (£10, & **Champion**[3]), & 16 **R. N. & H. C.**—RICHARD RADFORD, JUN., Field Farm, Shardlow, Derby.

18 **II.** (£5), & 19 **III.** (£3.)—P. WALKER, Parkfield Farm, Shipley, Ilkeston.

Class 4.—*Cows* (*in-milk*), *best adapted for Dairy purposes.*

22 **I.** (£6), & 21 **R. N. & H. C.**—RICHARD RADFORD, JUN., Field Farm, Shardlow, Derby.

24 **II.** (£3.)—REUBEN SHELTON, Grange Farm, Ruddington, Nottingham, for **Lady Mainstay,** roan, 8 years.

Class 5.—*Heifers, under* 3 *years old* (*in-milk*), *or to calve in* 1906.

27 **I.** (£5.)—A. HOLDEN, Stud Farm, Chevin, Belper, Derby, for **Chevin Buttercup,** red, 2 years 9 months; *s.* Beauty's Pride 78731, *d.* Buttercup.

28 **II.** (£3.)—WILLIAM WHITE, Lockington Grounds, Derby, for red and white.

29 **R. N. & H. C.**—P. WALKER Parkfield Farm, Shipley, Ilkeston, for red and white.

Class 6.—*Heifers, under* 2 *years old, best adapted for Dairy purposes.*

35 **I.** (£5.)—REUBEN SHELTON, Grange Farm, Ruddington, Nottingham, for **Lucy's Gazelle,** roan, 1 year 3 months 18 days: *s.* Starry Morn 82397, *d.* Frampton Gazelle *by* Earl of Torwood 65435.

31 **II.** (£3.)—LEES BROADBENT, The Cedars, Whaley Bridge, for **Cedars Mary,** red, 1 year 6 months; *s.* Chewton Victor 6th, *d. by* Fairy King.

30 **R. N. & H. C.**—RICHARD WARD, Old Hall Farm, Swanwick, Alfreton.

HORSES.

Shires.

Class 7.—*Yearling Entire Shire Colts.*

37 **I.** (£6.)—G. H. CAMP, Highfields Farm, Etwall, Derby, for **Etwall Conqueror,** bay; *s.* Markeaton Ransom 20696, *d.* Bounce 31098 *by* Bradbourne Mainstay 13896.

39 **II.** (£3.)—F. W. LOWNDES, Rolleston Park, Tutbury, for **Tutbury Busyman,** brown, bred by M. Hart; *s.* Bodenham King, *d.* Busybody *by* Dunsmore Cameronian.

40 **III.** (£1.)—R. MOORE & SONS, Beeston, Notts., for black; *s.* Lockinge Albert 15695, *d.* Princess May *by* Prince of Worsley 10210.

41 **R. N. & H. C.**—J. H. SNOW, Lower Castle, Hayes, Burton-on-Trent.

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[1] Prizes given by the Derbyshire Agricultural Society.

[2] Challenge Cup, value Twenty-five Guineas, given by the Duke of Devonshire, K.G., President of the Derbyshire Agricultural Society, for the best Bull bred by Exhibitor, a Tenant Farmer residing within the Society's area.

[3] Challenge Cup, value Twenty-five Guineas, given by the Duke of Devonshire, K.G., President of the Derbyshire Agricultural Society, for the best Cow bred by Exhibitor, a Tenant Farmer residing within the Society's area.

Class 8.—*Shire Mares, with Foals at foot.*

48 **I. (£10, & Champion.**[1])—ALFRED TWIGG, Hollington, Derby, for **Bonum Bounce** 41113, bay, 4 years [foal *by* Boro Menestrell II.], bred by B. W. Bullock, Weston-on-Trent; *s.* Tatton Talisman 17647, *d. by* Donovan 9764.

49 **II.** (£6.)—EGERTON ORME, Ash, Etwall, Derby, for **Ash Gipsy,** black, 3 years, bred by J. Brown; *s.* Mirthful, *d. by* Lake Commoner.

47 **III.** (£4.)—TIMOTHY LOWE, Stanton House, Burton-on-Trent, for **Underwood Lassie,** 27138, brown, 9 years [foal *by* Conquering Duke 17890], bred by W. R. Wardle; *s.* Galwich Heirloom 14547.

50 **IV.** (£3.)—EGERTON ORME, for **Tatton Iris** 34141, brown, 7 years [foal *by* Dunsmore Jameson], bred by W. Blackburn; *s.* The Forest Chief 17021. *d.* Cyntra 23402.

42 **R. N. & H. C.**—R. W. STEEPLES, Codnor Park, Alfreton, for **Catthorpe Malda.**

Class 9.—*Shire Colt Foals.*

64 **I.** (£5.)—EGERTON ORME, Ash, Etwall, Derby, for bay, 3 months; *s.* Dunsmore Jameson, *d.* Tatton Iris 34141 *by* The Forest Chief 17021. [*Exhibited with No.* 50.]

55 **II.** (£3.)—R. W. STEEPLES, Codnor Park, Alfreton; *s.* Ruddington Conquering Hero, *d.* Catthorpe Malda 23270. [*Exhibited with No.* 42.]

60 **III.** (£2.)—H. M. ORME, Hargate Manor, Hilton, Derby, for bay, 10 weeks; *s.* Bodenham King 17177, *d.* Markham Flower 22124 *by* Honest Tom 5123.

58 **R. N. & H. C.**—F. W. LOWNDES, Rolleston Park, Tutbury.

Class 10.—*Shire Filly Foals.*

67 **I.** (£5.)—T. H. TOMLINSON, Dale Farm, Willington, Derby, for bay, 3 months; *s.* Conquering Duke 17890, *d. by* Sopwell Duke.

75 **II.** (£3.)—J. & M. WALWYN, Bearwardcote, Etwall, Derby, for bay, 8 weeks; *s.* Dunsmore Jameson, *d. by* Dunsmore Willington Boy.

72 **III.** (£2.)—F. W. LOWNDES, Rolleston Park, Tutbury, for bay, 9 weeks; *s.* Bodenham King.

74 **R. N. & H. C.**—R. MOORE & SONS, Beeston, Notts.

Class 11.—3-*year-old Shire Fillies.*

80 **I.** (£5.)—JOHN COOKSON, Boro' Fields, Walton-on-Trent, for **Didsbury Venus,** brown, bred by A. Simpson; *s.* Northwood Victor 16295, *d.* Haunton Starlight 32397 *by* Nailstone Rising Star 14754.

83 **II.** (£3.)—EGERTON ORME, Ash, Etwall, Derby, for **Ash Gipsy,** black, bred by J. Brown; *s.* Mirthful, *d. by* Lake Commoner. [*Exhibited with No.* 49.]

79 **III.** (£2, & **R. N. for Champion.**[1])—ROBERT DEAVILLE. New Buildings, Shottle, Belper, Derby, for **Queen Mary**; *s.* Brandmark 19401, *d. by* Majestic 3208.

81 **R. N. &. H. C.**—J. SUMMERFIELD, Sutton-on-the-Hill, Derby, for **Sutton Flower.**

Class 12.—2-*year-old Shire Fillies.*

84 **I.** (£5.)—J. W. WHITEHURST, Markeaton, Derby, for **Markeaton Guiding Star,** bay, bred by the late J. P. Cross; *s.* Lockinge Forest King 18867, *d. by* Menestrel.

93 **II.** (£3.)—JOS. GRIMES, Highfields, Palterton, Chesterfield, for **Dunsmore Bonny Empress** 47819, black, bred by Sir P. A. Muntz, Bt.; *s.* Rokeby Commodore 20853, *d.* Bonny Mistress 21377.

86 **III.** (£2, & **R. N. for Champion.**[2])—J. & M. WALWYN, Bearwardcote, Etwall, Derby, for **Bearwardcote Fashion,** bay; *s.* Lockinge Forest King 18867, *d. by* Harold 3703.

89 **R. N. & H. C.**—TOM KAY, Ridgeway, Chesterfield, for **Bardon May Queen.**

Class 13.—1-*year-old Shire Fillies.*

103 **I.** (£5.)—EGERTON ORME, Ash, Etwall, Derby, for **Combere Abbess.** brown, bred by N. Forwood; *s.* Tatton Friar, *d. by* Regent 2nd.

102 **II.** (£3.)—JOS. GRIMES, Highfields, Palterton, Chesterfield, for bay, bred by M. Hubbard; *s.* Victor of Hitchin 18432, *d.* Juno of Worsley XI. 21995.

100 **III.** (£2, & **Champion.**[2])—TOM KAY, Carter Lodge, Ridgeway, Chesterfield, for **Girl from Kay's,** bay; *s.* Dunsmore Jameson 17972, *d.* Darby.

95 **R. N. & H. C.**—J. W. WHITEHURST, Markeaton, Derby, for **Markeaton Future Queen**

Hunters.

Class 14.—*Hunters, 4 years old and upwards, up to not less than 13 stone within the Meynell Hunt District of Derbyshire.*

108 **I.** (£7.)—RICHARD RADFORD, JUN., Field Farm, Shardlow, Derby, for bay, 4 years; *d. by* Little Jim.

106 **II.** (£3 10*s.*)—F. W. FOSTER, Culland, Brailsford, Derby, for **Mystery,** chestnut, 4 years.

105 **R. N. & H. C.**—F. W. FOSTER, for **Mischief.**

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[1] Silver Challenge Cup, value £15 15*s.*, given by Mr. J. W. Whitehurst, Markeaton, Derby, for the best animal of any age sired by any horse of the Markeaton Stud and entered in a previous class.

[2] Silver Challenge Cup, given by Mr. Edward Elsey, Hopwell Hall, Derby, for the best mare, filly, or filly foal bred by a Tenant Farmer residing within the Society's area.

BUTTER.

Class 15.—*Two Pounds of Butter, made without salt, from the milk of Cows other than Channel Island.*

113 **I.** (£2.)—A. MILNER, JUN., Top Farm, Stretton, Alfreton.
111 **II.** (£1.)—J. B. MELLOR, Haddon House, Over Haddon.
112 **III.** (10*s.*)—T. B. HANDLEY, Swarkestone, Derby.

BUTTER-MAKING COMPETITIONS.

In connection with the Midland Agricultural and Dairy College, Kingston, near Derby, and the Travelling Dairy School of the Derbyshire County Council.

Class A.—*Open only to residents in Derbyshire who have been Pupils of the Travelling Dairy School in Notts. or Derbyshire during the years* 1905 *and* 1906, *and who have* not *attended the longer courses at the Midland Agricultural and Dairy College or any similar Institution.*

121 & 125 **I.** (30*s.*) & **II.** (20*s.*)—Equally divided between MISS SARAH BATTY, Rock Farm, Sutton Scarsdale, Chesterfield, and MISS NELLIE HARRISON, Closes Farm, Littleover, Derby.
120 **III.** (10*s.*)—MISS SARAH J. DUNN, Duckmanton, Chesterfield.
127 **R. N. & H. C.**—MISS FRANCES GAMBLE, Chain Lane, Littleover. Derby.

Class B.—*Open only to residents in Derbyshire who have been Pupils of the Midland Agricultural and Dairy College during the years* 1905 *and* 1906.

131 **I.** (30*s.*)—MISS ANNIE PARKER, Manor House, Hasland.
130 **II.** (20*s.*)—MISS LIZZIE MILNER, Top Farm, Stretton, Alfreton.
132 **III.** (10*s.*)—MISS REBECCA E. PARKER, Manor House, Hasland.
129 **R. N. & H. C.**—MISS MARY ELLEN DUNN, Town End Farm, Flagg, Buxton.

Class C.—*Open only to residents in Derbyshire who have been Pupils of the Midland Agricultural and Dairy College or of the Travelling Dairy School in any year.*

147 **I.** (30*s.*)—MISS FRANCES GAMBLE, Chain Lane, Littleover, Derby.
144 **II.** (20*s.*)—MISS IDA BOWLER, Sunnyside, Tansley, Matlock.
148 **III.** (10*s.*)—MISS ANNIE SALT, Huffen Heath, Littleover, Derby.
143 **R. N. & H. C.**—MISS MARY ELLEN DUNN, Town End Farm, Flagg, Buxton.

Class D.—*Champion Class, open to any resident in Derbyshire who has obtained a prize in any of the preceding Classes, or who has obtained a prize in previous years, excepting the First Prize of the Champion Class, the winner of which is not eligible to compete again.*

158 **I.** (£3.)—MISS NELLIE HARRISON, Closes Farm, Littleover, Derby.
154 **II.** (£2.)—MISS ELLEN SMITH, Rock House, Tibshelf, Alfreton.
153 **III.** (£1 10*s.*)—MISS MARY ELLEN DUNN, Town End Farm, Flagg, Buxton.
159 **IV.** (£1.)—MISS FRANCES GAMBLE, Chain Lane, Littleover, Derby.
156 **R. N. & H. C.**—MISS ANNIE PARKER, Manor House, Hasland.

PRIZE LIST
For LINCOLN SHOW, JUNE 25-29, 1907.

Total value of Prizes offered (inclusive of Champion Prizes, Special Prizes, Cups, Medals, and Class Prizes), 8,376*l.* 10*s.*, of which amount 900*l.* are contributions from the Lincoln Local Committee, 139*l.* from the Lincolnshire Agricultural Society, 2,607*l.* 5*s.* from various Breed Societies, and 730*l.* 5*s.* from other sources.

CHAMPION PRIZES.

The following Champion Prizes are offered by Breed Societies :—

HORSES.

HUNTERS' IMPROVEMENT SOCIETY :—Two Gold Medals, value 10*l.* 10*s.* each, for the best Hunter Mare 4 years and upwards, and for the best Filly not exceeding 3 years old.

POLO AND RIDING PONY SOCIETY.—Two Gold Medals for the best Polo and Riding Pony Stallion or Colt, and for the best Mare or Filly.

HACKNEY HORSE SOCIETY :—Two Gold Medals, value 10*l.* each (or 10*l.* in money), for the best Hackney Stallion, and for the best Mare or Filly.

SHETLAND PONY STUD BOOK SOCIETY :—Silver Medal for the best Shetland Pony.

HACKNEY HORSE SOCIETY :—Gold Medal (or 5*l.* in money) for the best Mare or Gelding in the Single Driving Classes, the produce of a Registered Hackney Stallion.

SHIRE HORSE SOCIETY :—Two Gold Medals, value 10*l.* each (or 10*l.* in money), for the best Shire Stallion, and for the best Mare or Filly, and 5*l.* each to the Breeders of the Champion Shire Stallion, and Mare or Filly.

CLYDESDALE HORSE SOCIETY :—Two Prizes of 10*l.* each for the best Clydesdale Stallion, and for the best Mare or Filly.

SUFFOLK HORSE SOCIETY :—Challenge Cup, value fifty guineas, for the best Suffolk Stallion, the Cup to become the absolute property of an Exhibitor winning it three times.

CATTLE.

SHORTHORN SOCIETY :—Two Prizes of 30*l.* each for the best Shorthorn Bull, and for the best Cow or Heifer ; and 5*l.* each to the Breeders of the First Prize animals in the Inspection Classes for Shorthorns.

DAIRY SHORTHORN (COATES'S HERD BOOK) ASSOCIATION :—Prize of 10*l.* for the best Pedigree Shorthorn Dairy Cow or Heifer.

LINCOLNSHIRE RED SHORT-HORN ASSOCIATION :—Two Prizes of 10*l.* each for the best Lincolnshire Red Short-horn Bull, and for the best Cow or Heifer.

HEREFORD HERD BOOK SOCIETY :—Two Prizes of 10*l.* 10*s.* each for the best Hereford Bull, and for the best Cow or Heifer.

DEVON CATTLE BREEDERS' SOCIETY :—Two Prizes of 10*l.* 10*s.* each for the best Devon Bull, and for the best Cow or Heifer.

SUSSEX HERD BOOK SOCIETY :—Two Silver Medals, for the best Sussex Bull, and for the best Cow or Heifer.

WELSH BLACK CATTLE SOCIETY:—Prize of 5*l.* 5*s.* for the best Welsh Bull.

RED POLLED SOCIETY :—Two Prizes of 5*l.* 5*s.* each for the best Red Polled Bull, and for the best Cow or Heifer.

POLLED CATTLE SOCIETY :—A Gold Medal for the best breeding animal of the Aberdeen Angus breed.

ENGLISH ABERDEEN ANGUS CATTLE ASSOCIATION :—A Gold Medal for the best animal of the opposite sex to that of the animal awarded the Gold Medal of the Polled Cattle Society.

GALLOWAY CATTLE SOCIETY :—Two Prizes of 5*l.* 5*s.* each for the best Galloway Bull, and for the best Cow or Heifer.

HIGHLAND CATTLE SOCIETY :—Two Prizes of 10*l.* 10*s.* each for the best Highland Bull, and for the best Cow or Heifer.

ENGLISH KERRY AND DEXTER CATTLE SOCIETY :—Two Challenge Cups, value 26*l.* 5*s.* each, for the best Kerry Bull, Cow, or Heifer, and for the best Dexter Bull, Cow, or Heifer, each Cup to become the property of an Exhibitor winning it three years in succession.

ENGLISH JERSEY CATTLE SOCIETY :—Gold Medal (or 10*l.* in money), Silver Medal and Bronze Medal for the three best Jersey Animals in the Butter-test Classes.

SHEEP.

SOUTHDOWN SHEEP SOCIETY :—A Gold Medal (or 10*l.* 10*s.* in money) for the best Southdown Ram ; and Silver Medal for the best Pen of Ewes or Ewe Lambs.

HAMPSHIRE DOWN SHEEP BREEDERS' ASSOCIATION :—Prize of 10*l.* for the best Pen of Hampshire Down Ram Lambs, or Ewe Lambs.

LINCOLN LONG-WOOL SHEEP BREEDERS' ASSOCIATION :—A Piece of Plate, value 10*l.* 10*s.*, for the best pen of five Lincoln Shearling Rams, also gratuities to Shepherds of winning pens of five Shearling Rams and pens of three Yearling Ewes.

SOCIETY OF BORDER LEICESTER SHEEP BREEDERS :—A Prize of 5*l.* for the best Border Leicester Ram.

PIGS.

NATIONAL PIG BREEDERS' ASSOCIATION :—Three Gold Medals, or 5*l.* 5*s.* in money, for the best Large White Boar or Sow, Middle White Boar or Sow, and Tamworth Boar or Sow.

BRITISH BERKSHIRE SOCIETY :—Two Gold Medals, value 5*l.* 5*s.* each (or 5*l.* 5*s.* in money) for the best Berkshire Boar and best Sow.

LARGE BLACK PIG SOCIETY :—Prize of 10*l.* for the best Large Black Boar : and a Challenge Cup, value twenty guineas, for the best Large Black Sow, the Cup to become the absolute property of an Exhibitor winning it twice in succession or three times in all.

HORSES (£2,626).

HUNTERS.[1]

	Prizes 1st £	2nd £	3rd £
COLT OR GELDING, foaled in 1906	15	10	5
GELDING, foaled in 1905	15	10	5
GELDING, foaled in 1904	15	10	5
FILLY, foaled in 1906	15	10	5
FILLY, foaled in 1905	15	10	5
FILLY, foaled in 1904	15	10	5
MARE, with foal at foot (up to 14 st.)	15	10	5
MARE, with foal at foot (up to more than 14 st.)	15	10	5
COLT FOAL, produce of Mare in above classes	10	6	4
FILLY FOAL, produce of Mare in above classes	10	6	4

A SPECIAL PRIZE of 10*l.* for the best Hunter Brood Mare, and 5*l.* for the best Foal.[2]

POLO AND RIDING PONIES.

STALLION, foaled in or before 1904	15	10	5
COLT, FILLY, OR GELDING, foaled in 1906, not over 13 h. 3 in.[3]	10	8	5
COLT, FILLY, OR GELDING, foaled in 1905, not over 14 h. 1 in.[3]	10	8	5
FILLY OR GELDING, foaled in 1904, not over 14 h. 1½ in.[3]	10	8	5
MARE (with foal at foot), not over 14 h. 2 in.	15	10	5

CLEVELAND BAYS.[4]

STALLION, foaled in 1904 or 1905	15	10	5
FILLY, foaled in 1904 or 1905	15	10	5
MARE (with foal at foot)	15	10	5

COACH HORSES.[5]

STALLION, foaled in 1904 or 1905	15	10	5
FILLY, foaled in 1904 or 1905	15	10	5
MARE (with foal at foot)	15	10	5

HACKNEYS.

STALLION, foaled in 1906	15	10	5
STALLION, foaled in 1905	15	10	5
STALLION, foaled in 1904	15	10	5
FILLY, foaled in 1906	15	10	5
FILLY, foaled in 1905	15	10	5
FILLY, foaled in 1904	15	10	5
MARE (with foal at foot), over 14 h., and not over 15 h. 2 in.	15	10	5
MARE (with foal at foot), over 15 h. 2 in.[6]	15	10	5
COLT FOAL, produce of Mare in above classes[6]	10	6	4
FILLY FOAL, produce of Mare in above classes[6]	10	6	4

A SPECIAL PRIZE of 10*l.* for the best Hackney Brood Mare.[2]

HACKNEY PONIES.

	Prizes 1st £	2nd £	3rd £
STALLION, foaled in or before 1904, not over 14 h.	15	10	5
COLT, FILLY, OR GELDING, foaled in 1905, not over 13 h. 2 in.[6]	10	8	5
FILLY OR GELDING, foaled in 1904, not over 13 h. 3 in.[6]	10	8	5
MARE (with foal at foot), not over 14 h.	15	10	5

SHETLAND PONIES.

STALLION, foaled in or before 1904, not over 10½ h.	10	6	–
MARE, foaled in or before 1904, not over 10½ h.	10	6	–

RIDING AND DRIVING CLASSES.[7]

Hunters.

MARE OR GELDING, foaled in 1903, up to from 12 st. to 14 st.	15	10	5
MARE OR GELDING, foaled in 1903, up to more than 14 st.	15	10	5
MARE OR GELDING (Novice), foaled in or before 1902, up to from 12 st. to 14 st.	15	10	5
MARE OR GELDING (Novice), foaled in or before 1902, up to more than 14 st.	15	10	5
MARE OR GELDING, foaled in or before 1903, up to from 12 st. to 13 st. 7 lb.	20	10	5
MARE OR GELDING, foaled in or before 1903, up to more than 13 st. 7 lb. and not over 15 st.	20	10	5
MARE OR GELDING, foaled in or before 1903, up to more than 15 st.	20	10	5

SPECIAL PRIZES of 10*l.* each for the best Hunter Mare and best Hunter Gelding.[2]

Polo and Riding Ponies.

MARE OR GELDING, foaled in 1902 or 1903, not over 14 h. 2 in., or with Hurlingham Certificate	15	10	5

To be driven in Harness.

MARE OR GELDING (Novice), not over 14 h.	10	6	4
MARE OR GELDING (Novice), over 14 h. and not over 15 h.	10	6	4
MARE OR GELDING (Novice), over 15 h., and not over 15 h. 2 in.	10	6	4
MARE OR GELDING (Novice), over 15 h. 2 in.	10	6	4
MARE OR GELDING, not over 13 h. 2 in.	10	6	4
MARE OR GELDING, over 13 h. 2 in. and not over 14 h.	10	6	4
MARE OR GELDING, over 14 h. and not over 15 h.	10	6	4
MARE OR GELDING, over 15 h. and not over 15 h. 2 in.	10	6	4
MARE OR GELDING, over 15 h. 2 in.	10	6	4

[1] £160 towards these Prizes are offered by gentlemen interested in the breeding of Hunters, and £60 are offered by the Lincoln Local Committee.
[2] Offered by the Lincolnshire Agricultural Society.
[3] Offered by the Polo and Riding Pony Society.
[4] £30 provided by the Cleveland Bay Horse Society.
[5] £30 provided by the Yorkshire Coach Horse Society.
[6] Offered by the Hackney Horse Society.
[7] Offered by the Lincoln Local Committee.

HARNESS HORSES[1] AND PONIES.

	Prizes 1st £	2nd £	3rd £
PAIR OF HORSES (Mares or Geldings), not over 15 h. 2 in.	10	6	4
PAIR OF HORSES (Mares or Geldings), over 15 h. 2 in.	10	6	4
TANDEM (Mares or Geldings), not over 15 h.	10	6	4
TANDEM (Mares or Geldings), over 15 h.	10	6	4

JUMPING COMPETITIONS.[1]

	Prizes 1st £	2nd £	3rd £	4th £	5th £	6th £
A MARE OR GELDING, not over 15 h. 2 in.	20	15	10	–	–	–
B CONSOLATION CLASS, for animals which have not won a prize in Class A	10	5	3	–	–	–
C MARE OR GELDING, over 15 h. 2 in.	20	15	10	–	–	–
D CONSOLATION CLASS, for animals which have not won a prize in Class C.	10	5	3	–	–	–
E CHAMPION CLASS, Mare or Gelding, any height	20	15	10	8	6	4

PACE AND ACTION COMPETITIONS.[1]

	Prizes 1st £	2nd £	3rd £
SINGLE HARNESS HORSES, not over 15 h.	20	10	5
SINGLE HARNESS HORSES, over 15 h.	20	10	5

SHIRE.

	1st £	2nd £	3rd £
STALLION, foaled in 1906	15	10	5
STALLION, foaled in 1905	15	10	5
STALLION, foaled in 1904	15	10	5
FILLY, foaled in 1906[2]	15	10	5
FILLY, foaled in 1905	15	10	5
FILLY, foaled in 1904	15	10	5
MARE (with foal at foot)	15	10	5
COLT FOAL, produce of mare in above class[2]	10	6	4
FILLY FOAL, produce of mare in above class[2]	10	6	4

SPECIAL PRIZE of 10*l*. for best Brood Mare.[3]

CLYDESDALE.[4]

	1st £	2nd £	3rd £
STALLION, foaled in 1906	15	10	5
STALLION, foaled in 1905	15	10	5
STALLION, foaled in 1904	15	10	5
FILLY, foaled in 1905	15	10	5
FILLY, foaled in 1904	15	10	5
MARE (with foal at foot)	15	10	5
FOAL, produce of mare in above class	10	6	4

SUFFOLK.

	Prizes 1st £	2nd £	3rd £
STALLION, foaled in 1905	10	6	4
STALLION, foaled in 1904	15	10	5
FILLY, foaled in 1905	10	6	4
FILLY, foaled in 1904	10	6	4
MARE (with foal at foot)	15	10	5

DRAUGHT HORSES.[1]

	1st £	2nd £	3rd £
GELDING, foaled in 1905	15	10	5
GELDING, foaled in 1904	15	10	5

ASSES (£14). Of any Breed.

	1st £	2nd £	3rd £
STALLION, foaled in or previously to 1905, 13 h. and over[5]	5	2	0
MARE (with or without foal), 12 h. and over[5]	5	2	0

CATTLE (£2,591 5s.).

SHORTHORN.

	1st £	2nd £	3rd £
BULL, calved in 1902, 1903 or 1904	10	6	4
BULL, calved on or between Jan. 1, 1905, and June 30, 1905	10	6	4
BULL, calved on or between July 1, 1905, and Dec. 31, 1905[6]	10	6	4
BULL, calved on or between Jan. 1, 1906, and June 30, 1906	10	6	4
BULL, calved on or between July 1, 1906, and Dec. 31, 1906[6]	10	6	4
GROUP CLASS, consisting of Bull, and two, three, or four of his MALE offspring, bred by Exhibitor, not less than six months old on the day of entry[6]	20	10	–
COW, in-milk, calved previously to or in 1903	10	6	4
HEIFER, in-milk, calved in 1904[6]	10	6	4
HEIFER, calved in 1905	10	6	4
HEIFER, calved in 1906	10	6	4
DAIRY COW, in-milk, calved previously to or in 1902[6]	10	6	4
DAIRY COW, in-milk, calved in 1903[6]	10	6	4
DAIRY HEIFER, in-milk, calved in 1904[7]	10	6	4
Milk Yield Prizes	10	6	4

SPECIAL PRIZES of 10*l*. each for the best Shorthorn Bull and Cow or Heifer.[3]

LINCOLNSHIRE RED SHORT-HORN.[8]

	Prizes 1st £	2nd £	3rd £	4th £
BULL, calved before 1903	10	6	4	3
BULL, calved in 1903 or 1904.	10	6	4	3
BULL, calved in 1905	10	6	4	3
BULL, calved in 1906	10	6	4	3
COW, in-milk, calved previously to 1904	10	6	4	3
COW AND CALF	10	6	4	3
HEIFER, in-milk, calved in 1904.	10	6	4	3

1 Offered by the Lincoln Local Committee.
2 Offered by the Shire Horse Society.
3 Offered by the Lincolnshire Agricultural Society.
4 £50 provided by the Clydesdale Horse Society.
5 Offered by Breeders of Asses.
6 Offered by the Shorthorn Society.
7 Offered by the Dairy Shorthorn (Coates's Herd Book) Association.
8 £193 provided by the Lincolnshire Red Short-horn Association.

LINCOLNSHIRE RED SHORT-HORN.[1] (*continued*).

	Prizes 1st £	2nd £	3rd £	4th £
HEIFER, calved in 1905	10	6	4	3
HEIFER, calved in 1906	10	6	4	3
COW, in-milk, calved before or in 1903, showing the best milking properties	10	6	4	3
HEIFER, in-milk, calved in 1904, showing the best milking properties	10	6	4	3
Milk Yield Prizes	10	6	4	3

SPECIAL PRIZES of 10*l.* each for the best Lincolnshire Red Short-horn Bull and Cow or Heifer.[2]

HEREFORD.[3]

	1st £	2nd £	3rd £	
BULL, calved in 1902, 1903, or 1904	10	6	4	–
BULL, calved in 1905	10	6	4	–
BULL, calved in 1906	15	8	4	2
COW OR HEIFER, in-milk, calved before or in 1904	10	6	4	–
HEIFER, calved in 1905	10	6	4	–
HEIFER, calved in 1906	10	6	4	–

DEVON.[4]

	1st £	2nd £	3rd £
BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
BULL, calved in 1906	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905 or 1906	10	6	4

SOUTH DEVON.

BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
COW OR HEIFER, in-milk, calved before or in 1904	10	6	4
Milk Yield Prizes	10	6	4

SUSSEX.[5]

BULL, calved in 1902, 1903, or 1904	15	10	4
BULL, calved in 1905	15	10	4
BULL, calved in 1906	15	10	4
COW OR HEIFER, in-milk, calved previously to or in 1904	15	10	4
HEIFER, calved in 1905	15	10	4
HEIFER, calved in 1906	15	10	4

WELSH.

BULL, calved on or after Dec. 1, 1901, and before Dec. 1, 1906	10	6	4
COW OR HEIFER, in-milk, calved before Dec. 1, 1904	10	6	4
HEIFER, calved on or after Dec. 1, 1904, and before Dec. 1, 1906	10	6	4

RED POLLED.[6]

BULL, calved in 1902, 1903, or 1904	10	6	4
BULL, calved in 1905	10	6	4
BULL, calved in 1906	10	6	4

RED POLLED. (*continued*).

	Prizes 1st £	2nd £	3rd £
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905	10	6	4
HEIFER, calved in 1906	10	6	4
Milk Yield Prizes	10	6	4

ABERDEEN ANGUS.

BULL, calved on or after Dec. 1, 1901, and before Dec. 1, 1904	10	6	4
BULL, calved on or after Dec. 1, 1904, and before Dec. 1, 1905	10	6	4
BULL, calved on or after Dec. 1, 1905, and before Dec. 1, 1906	10	6	4
COW OR HEIFER, in-milk, calved before Dec. 1, 1904	10	6	4
HEIFER, calved on or after Dec. 1, 1904, and before Dec. 1, 1905	10	6	4
HEIFER, calved on or after Dec. 1, 1905, and before Dec. 1, 1906	10	6	4

GALLOWAY.[7]

BULL, calved on or after Dec. 1, 1901, and before Dec. 1, 1905	10	6	4
BULL, calved on or after Dec. 1, 1905, and before Dec. 1, 1906	10	6	4
COW OR HEIFER, in-milk, calved before Dec. 1, 1904	10	6	4
HEIFER, calved on or after Dec. 1, 1904, and before Dec. 1, 1906	10	6	4

HIGHLAND.

BULL, calved before or in 1904[8]	10	6	4
BULL, calved in 1905 or 1906	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905 or 1906.[8]	10	6	4

AYRSHIRE.[9]

BULL, calved in 1902, 1903, 1904, 1905, or 1906	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
Milk Yield Prizes	10	6	4

JERSEY.

BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
BULL, calved in 1906	10	6	4
COW, in-milk, calved previously to or in 1903	10	6	4
HEIFER, in-milk, calved in 1904	10	6	4
HEIFER, in-milk, calved in 1905	10	6	4
HEIFER, calved in 1906	10	6	4
COW OR HEIFER, in-milk, bred by Exhibitor, sired in Great Britain or Ireland[10]	10	6	4
Milk Yield Prizes	10	6	4

GUERNSEY.[11]

BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
BULL, calved in 1906	10	6	4

[1] £193 provided by the Lincolnshire Red Short-horn Association.
[2] Offered by the Lincolnshire Agricultural Society.
[3] £29 provided by the Hereford Herd Book Society.
[4] £8 provided by the South Devon Herd Book Society.
[5] £54 provided by the Sussex Herd Book Society.
[6] £20 provided by the Red Polled Society.
[7] £8 provided by the Galloway Cattle Society.
[8] Offered by the Highland Cattle Society.
[9] £8 provided by the Ayrshire Cattle Herd Book Society.
[10] Offered by the English Jersey Cattle Society.
[11] £10 provided by the English Guernsey Cattle Society.

GUERNSEY.[1] (*continued*).	Prizes 1st £	2nd £	3rd £
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905.	10	6	4
HEIFER, calved in 1906.	10	6	4
Milk Yield Prizes	10	6	4
LONGHORN.[2]			
BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
BULL, calved in 1906	10	6	–
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905 or 1906	10	6	–
Milk Yield Prizes	10	6	4
KERRY.			
BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
COW OR HEIFER, in-milk, calved previously to or in 1904	10	6	4
HEIFER, calved in 1905 or 1906 [3]	10	6	4
Milk Yield Prizes	10	6	4
DEXTER.			
BULL, calved in 1902, 1903, 1904, or 1905	10	6	4
COW, in-milk, calved previously to or in 1903	10	6	4
HEIFER, in-milk, calved in 1904 [3]	10	6	4
HEIFER, calved in 1905 or 1906	10	6	4
Milk Yield Prizes	10	6	4

SPECIAL MILK YIELD.

(Judged without Inspection.)

COW, in-milk, of any age, breed, or cross [4]	20	10	5

BUTTER TESTS.[4]

COW, of any age, breed, or cross, exceeding 900 lb. live weight	15	10	5
COW, of any age, breed, or cross, not exceeding 900 lb. live weight	15	10	5
SPECIAL PRIZES for the 3 cows in above classes obtaining the greatest number of points in the competition	20	10	5

SHEEP (£1,829).

OXFORD DOWN.[5]	Prizes 1st £	2nd £	3rd £	4th £
SHEARLING RAM	10	5	3	2
THREE RAM LAMBS, dropped in 1907	10	5	3	2
THREE SHEARLING EWES	10	5	3	2
THREE EWE LAMBS, dropped in 1907	10	5	3	2

SHROPSHIRE.	Prizes. 1st £	2nd £	3rd £	4th £
TWO-SHEAR RAM [6]	10	5	3	–
SHEARLING RAM	10	5	3	–
FIVE SHEARLING RAMS [6]	15	10	5	–
SELLING CLASS FOR SHEARLING RAMS [6]	20	15	10	5
THREE RAM LAMBS, dropped in 1907	10	5	3	–
THREE SHEARLING EWES	10	5	3	–
THREE EWE LAMBS, dropped in 1907	10	5	3	–

SOUTHDOWN.	Prizes 1st £	2nd £	3rd £
TWO-SHEAR RAM [7]	10	5	3
SHEARLING RAM.	10	5	3
THREE SHEARLING RAMS [7]	10	5	3
THREE RAM LAMBS, dropped in 1907	10	5	3
THREE SHEARLING EWES	10	5	3
THREE EWE LAMBS, dropped in 1907	10	5	3
HAMPSHIRE DOWN.			
TWO-SHEAR RAM [8]	10	5	3
SHEARLING RAM.	10	5	3
THREE RAM LAMBS, dropped in 1907	10	5	3
THREE SHEARLING EWES	10	5	3
THREE EWE LAMBS, dropped in 1907	10	5	3
SUFFOLK.			
TWO-SHEAR RAM [9]	10	5	3
SHEARLING RAM.	10	5	3
RAM LAMB, dropped in 1907 [9]	10	5	3
THREE RAM LAMBS, dropped in 1907	10	5	3
THREE SHEARLING EWES	10	5	3
THREE EWE LAMBS, dropped in 1907	10	5	3
DORSET HORN.			
SHEARLING RAM, dropped after Nov. 1, 1905	10	5	3
THREE RAM LAMBS, dropped after Nov. 1, 1906	10	5	3
THREE SHEARLING EWES, dropped after Nov. 1, 1905	10	5	3
THREE EWE LAMBS, dropped after Nov. 1, 1906 [10]	10	5	3
RYELAND.			
RAM, TWO SHEAR and upwards [11]	10	5	3
SHEARLING RAM	10	5	3
THREE SHEARLING EWES	10	5	3

1 £10 provided by the English Guernsey Cattle Society.
2 £22 provided by the Longhorn Cattle Society.
3 Offered by the English Kerry and Dexter Cattle Society.
4 Offered by the English Jersey Cattle Society.
5 £8 provided by the Oxford Down Sheep Breeders' Association.
6 Offered by the Shropshire Sheep Breeders' Association.
7 Offered by the Southdown Sheep Society.
8 Offered by the Hampshire Down Sheep Breeders' Association.
9 Offered by the Suffolk Sheep Society.
10 Offered by the Dorset Horn Sheep Breeders' Association.
11 Offered by the Ryeland Flock Book Society.

KERRY HILL.[1]

	Prizes 1st £	2nd £	3rd £
RAM, TWO SHEAR and upwards	10	5	3
SHEARLING RAM	10	5	3
THREE SHEARLING EWES	10	5	3
THREE EWE LAMBS, dropped in 1907	10	5	3

LINCOLN.[2]

	1st £	2nd £	3rd £	4th £	5th £	6th £
TWO-SHEAR RAM	10	5	3	2	–	–
SHEARLING RAM	15	10	7	5	4	3
SHEARLING RAM, the property of an Exhibitor who has never exhibited Lincoln Sheep at any previous Show of the R.A.S.E.	10	5	3	–	–	–
FIVE SHEARLING RAMS	30	20	16	14	12	8
FIVE SHEARLING RAMS, the property of an Exhibitor who has never exhibited Lincoln Sheep at any previous Show of the R.A.S.E.	15	10	5	2	–	–
THREE RAM LAMBS, dropped in 1907	10	5	3	2	–	–
THREE SHEARLING EWES	10	5	3	2	–	–
THREE EWE LAMBS, dropped in 1907	10	5	3	2	–	–
THREE YEARLING EWES, shown in their wool	25	20	15	12	10	8

Group prize of One Exhibit from not less than Four Classes of Lincoln Long-Wool Sheep exhibited in the before-mentioned Classes. The general character of the Flock to be taken into consideration . . . — 1st Prize, Piece of Plate value £15; 2nd Prize, Piece of Plate value £10

Special Prizes of £10 each for the best Lincoln Ram, and for the best Pen of Lincoln Shearling Ewes, Ewe Lambs, or Yearling Ewes.[3]

LEICESTER.[4]

	Prizes 1st £	2nd £	3rd £
SHEARLING RAM	10	5	3
THREE RAM LAMBS, dropped in 1907	10	5	3
THREE SHEARLING EWES	10	5	3
THREE EWE LAMBS, dropped in 1907	10	5	3

COTSWOLD.[5]

	Prizes 1st £	2nd £	3rd £
SHEARLING RAM	10	5	-
THREE RAM LAMBS, dropped in 1907	10	5	-
THREE SHEARLING EWES	10	5	-
THREE EWE LAMBS, dropped in 1907	10	5	-

BORDER LEICESTER.[6]

	1st £	2nd £	3rd £
RAM, TWO SHEAR and upwards	10	5	-
SHEARLING RAM	10	5	-
THREE SHEARLING EWES, of same flock	10	5	-

KENT OR ROMNEY MARSH.[7]

	1st £	2nd £	3rd £	4th £
TWO-SHEAR RAM	10	5	3	-
SHEARLING RAM	10	5	3	2
THREE RAM LAMBS, dropped in 1907	10	5	3	2
THREE SHEARLING EWES	10	5	3	2
THREE EWE LAMBS, dropped in 1907	10	5	3	2

WENSLEYDALE.

	1st £	2nd £	3rd £
TWO SHEAR RAM[8]	10	5	-
SHEARLING RAM[9]	10	5	3
THREE SHEARLING EWES[9]	10	5	3

DEVON LONG-WOOL.[10]

	1st £	2nd £	3rd £
SHEARLING RAM	10	5	–
THREE RAM LAMBS, dropped in 1907	10	5	–
THREE SHEARLING EWES	10	5	–

SOUTH DEVON.[11]

	1st £	2nd £	3rd £
RAM, SHEARLING and upwards	10	5	-
THREE SHEARLING EWES	10	5	-

DARTMOOR.[12]

Same as for South Devon.

EXMOOR.[13]

Same as for South Devon.

CHEVIOT.[14]

Same as for South Devon.

LONK.[15]

Same as for South Devon.

HERDWICK.[16]

Same as for South Devon.

1 £30 provided by the Kerry Hill Flock Book Society.
2 £317 provided by the Lincoln Long-Wool Sheep Breeders' Association.
3 Offered by the Lincolnshire Agricultural Society.
4 £18 provided by the Leicester Sheep Breeders' Association.
5 £25 provided by the Cotswold Sheep Society.
6 £15 provided by the Society of Border Leicester Sheep Breeders.
7 £26 provided by the Kent or Romney Marsh Sheep Breeders' Association.
8 Offered by the Wensleydale Blue-faced Flock Book Association.
9 £5 provided by the Wensleydale Sheep Breeders' Association.
10 £15 provided by the Devon Long-Woolled Sheep Breeders' Society.
11 £10 provided by the South Devon Flock Book Association.
12 £10 provided by Breeders of Dartmoor Sheep.
13 £10 provided by the Exmoor Sheep Breeders' Society.
14 £10 provided by the Cheviot Flock Book Society.
15 £10 provided by the Lonk Sheep Breeders' Association.
16 £10 provided by the Breeders of Herdwick Sheep.

WELSH MOUNTAIN.

Same as for South Devon.

BLACK-FACED MOUNTAIN.

	Prizes 1st £	2nd £	3rd £
RAM, SHEARLING and upwards	10	-	-
THREE SHEARLING EWES	10	-	-

PIGS (£599 5s.).

Special Prizes of £10 each for the best Large White Boar, and for the best Sow.[1]

Large White[2], Middle White[2], Tamworth[2], Berkshire[3], Large Black[4] — For Prizes see below.

In each of the above Breeds the following prizes will be given:—

	1st £	2nd £	3rd £
BOAR, farrowed in 1905 or 1906	10	5	3
BOAR PIG, farrowed in 1907	10	5	3
BREEDING SOW, farrowed in 1903, 1904, or 1905.	10	5	3
SOW, farrowed in 1906.	10	5	3
THREE SOW PIGS, farrowed in 1907.	10	5	3

LINCOLNSHIRE CURLY-COATED.

BOAR, farrowed in 1905 or 1906	10	5	3
BOAR PIG, farrowed in 1907[5]	10	5	3
BREEDING SOW, farrowed in 1903, 1904, 1905, or 1906	10	5	3
THREE SOW PIGS, farrowed in 1907[5]	10	5	3

POULTRY (£160 5s.).

Prizes are offered for the best COCK, HEN, COCKEREL, and PULLET of the following Breeds:—

	Prizes s.	s.	s.
Game, Old English	20	10	5
Game, Indian	20	10	5
A Special Prize of 20*s.* for best Bird in above Classes.			
Langshan	20	10	5
Plymouth Rock, Barred	20	10	5
Plymouth Rock, other variety	20	10	5
Wyandotte, Gold or Silver Laced	20	10	5
Wyandotte, White	20	10	5
Wyandotte, Partridge	20	10	5
Wyandotte, other variety	20	10	5
Orpington, Buff	20	10	5
Orpington, White	20	10	5
Orpington, Black	20	10	5
Minorca	20	10	5
Leghorn, White	20	10	5
Leghorn, Black	20	10	5
Leghorn, other colour	20	10	5
Andalusian	20	10	5
A Special Prize of 20*s.* for best Bird in above Classes.			

POULTRY. (*continued*).

	Prizes 1st s.	2nd s.	3rd s.
Dorking, Coloured	20	10	5
Dorking, other variety	20	10	5
Sussex, any variety	20	10	5
Brahma and Cochin	20	10	5
French, Faverolle	20	10	5
French, other variety	20	10	5
A Special Prize of 20*s.* for best Bird in above Classes.			

TABLE FOWLS.

(To be sent and exhibited alive).

PAIR of COCKERELS or PULLETS, pure-breed	20	10	5
PAIR of CROSS-BRED COCKERELS or PULLETS	20	10	5

DUCKS, &c.

Aylesbury Drake	20	10	5
Aylesbury Duck	20	10	5
Rouen Drake	20	10	5
Rouen Duck	20	10	5
Indian Runner Drake	20	10	5
Indian Runner Duck	20	10	5
Any other breed, Drake	20	10	5
Any other breed, Duck	20	10	5
Gander	30	20	10
Goose	30	20	10
Turkey, Cock	30	20	10
Turkey, Hen	30	20	10

PRODUCE (£229 15s.).

BUTTER.

Box of Twelve 2 lb. Rolls of BUTTER, not more than 1 per cent. salt. 1st 4*l.*, 2nd 2*l.*, 3rd 1*l.*

2 pounds of FRESH BUTTER, slightly salted, made up in pounds — Four of 2*l.* each. Four of 1*l.* each. Four of 10*s.* each.

CHEESE.

(*Made in* 1907.)

	Prizes 1st £	2nd £	3rd £	4th £
THREE CHEDDAR, of not less than 50 lb. each	5	3	2	1
THREE CHESHIRE, of not less than 40 lb. each	5	3	2	1
THREE STILTON	4	3	1	-
THREE WENSLEYDALE (Stilton Shape)	4	3	1	-
THREE DOUBLE GLOUCESTER	4	3	1	-
THREE CHEDDAR TRUCKLE	3	2	1	-

CIDER AND PERRY.

	Prizes 1st £	2nd £	3rd £
Cask of CIDER, made 1906	5	3	2
ONE DOZ. CIDER, made 1906	5	3	2
ONE DOZ. CIDER, made before 1906	5	3	2
ONE DOZ. PERRY.	5	3	2

[1] Offered by the Lincolnshire Agricultural Society.
[2] £54 provided by the National Pig Breeders' Association.
[3] £18 provided by the British Berkshire Society.
[4] £18 provided by the Large Black Pig Society.
[5] Offered by the Lincolnshire Curly-Coated Pig Breeders' Association.

WOOL (*of* 1907 *Clip*).

3 *Fleeces in each Entry.*

	Prizes 1st £	2nd £	3rd £	4th £
Leicester or Border Leicester	3	2	1	–
Lincoln[1]	4	3	2	1
Kent or Romney Marsh	3	2	1	–
Any other Long Wool	3	2	1	–
Southdown	3	2	1	–
Shropshire	3	2	1	–
Any other Short Wool	3	2	1	–
Welsh	3	2	1	–
Cheviot	3	2	1	–
Scotch	3	2	1	–

HIVES, HONEY, AND BEE APPLIANCES.

Offered by British Bee-keepers' Association.

	1st *s.*	2nd *s.*	3rd *s.*
Collection of HIVES	80	40	20
FRAME HIVE	20	15	10
Do. for Cottagers' use	20	15	10
HONEY EXTRACTOR	15	10	–
OBSERVATORY HIVE (not more than 3 frames)	20	15	10
USEFUL APPLIANCES	10	–	–

HONEY.

	1st *s.*	2nd *s.*	3rd *s.*	4th *s.*
12 Sections of COMB HONEY	20	15	10	5
RUN OR EXTRACTED HONEY	20	15	10	5

Entries in the above two Classes are open only to Members of the Lincolnshire Bee-keeper's Association and residents in the county of Lincoln.

For the purposes of Classes for Honey the United Kingdom has been divided into Two Districts:—

1. Counties of Cheshire, Cumberland, Derby, Durham, Hereford, Lancashire, Leicester, Lincoln, Monmouth, Northumberland, Nottingham, Rutland, Salop, Stafford, Warwick, Westmorland, Worcester, Yorkshire, the Isle of Man, Ireland, Scotland, or Wales.

HONEY (*continued*).

2. Counties of Bedford, Berks., Bucks., Cambridge, Cornwall, Devon, Dorset, Essex, Gloucester, Hampshire, Herts., Hunts., Isle of Wight, Kent, Middlesex, Norfolk, Northampton, Oxford, Somerset, Suffolk, Surrey, Sussex, or Wiltshire.

For each of the above Districts the following four Classes and Prizes, for Honey of any year, have been provided:—

HONEY.

	Prizes 1st *s.*	2nd *s.*	3rd *s.*
12 Sections of COMB HONEY, about 12 lb.	20	15	10
RUN OR EXTRACTED, LIGHT-COLOURED HONEY, about 12 lb.	20	15	10
RUN OR EXTRACTED, MEDIUM OR DARK-COLOURED HONEY, about 12 lb.	20	15	10
GRANULATED HONEY, about 12 lb.	20	15	10

MISCELLANEOUS.

	1st *s.*	2nd *s.*	3rd *s.*
3 Shallow frames of COMB HONEY, for extracting	20	15	10
6 Jars of HEATHER HONEY, about 6 lb.	20	15	10
6 Jars of HEATHER MIXTURE EXTRACTED HONEY, about 6 lb.	20	15	10
DISPLAY OF HONEY	30	20	10
2 lb. of WAX	10	7/6	5
3 lb. of WAX, in marketable form, suitable for retail trade	10	7/6	5
HONEY VINEGAR, ½ gallon	7/6	5	–
MEAD, ½ gallon	7/6	5	–
OTHER PRACTICAL EXHIBITS	10	–	–
OTHER SCIENTIFIC EXHIBITS	10	–	–

HORSE-SHOEING COMPETITIONS (£27).

(*Open to the United Kingdom.*)

CLASS I. Hunters (Wednesday, June 26). CLASS II. Cart Horses (Friday, June 28). Prizes in each Class as follows:—1st, 3*l.* 10*s.*; 2nd, 3*l.*; 3rd, 2*l.* 10*s.*; 4th, 2*l.*; 5th, 1*l.* 10*s.* 6th, 1*l.*

FARM PRIZE COMPETITIONS.

(*Open to* bonâ-fide *Tenant Farmers.*)

CLASS I.—Best-managed Arable and Grass Farm, in the County of Lincoln, exceeding 300 acres. First Prize, 60*l.*; Second Prize, 30*l.*[2] [41 entries.]

CLASS II.—Best-managed Arable and Grass Farm, in the County of Lincoln, over 50 acres and not exceeding 300 acres. First Prize, 35*l.*; Second Prize, 25*l.*[2] [49 entries.]

CLASS III.—Best-managed Arable and Grass Farm, regularly hunted over by the Belvoir, Blankney, Brocklesby, Burton, or Southwold Hounds, exceeding 300 acres. First Prize, 30*l.*; Second Prize, 25*l.*; Third Prize, 20*l.*[3] [40 entries.]

CLASS IV.—Best-managed Arable and Grass Farm, regularly hunted over by the Belvoir, Blankney, Brocklesby, Burton, or Southwold Hounds, over 50 acres and not exceeding 300 acres. First Prize, 25*l.*; Second Prize, 20*l.*; Third Prize, 15*l.*; Fourth Prize, 15*l.*[3] [53 entries.]

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[1] First Prize offered by the Lincolnshire Agricultural Society.
[2] Contributed from various sources.
[3] Offered by the several Hunts.

LINCOLN SHOW, JUNE 25 TO 29, 1907.

Principal Regulations as to Entry Fees, &c.

The following will be the Fees (including all charges for Stabling) payable for the several descriptions of Exhibits by Members of the Royal Agricultural Society of England, Members of the Lincolnshire Agricultural Society, and by Non-Members respectively :—

For any Entry received in a complete form—

	Members		Non-Members
Horses and Asses:			
Stallions and Brood Mares—			
On or before Tuesday, May 14	40/-	...	80/-
On or before Tuesday, May 28	50/-	...	100/-
Other Entries in Breeding Classes—			
On or before Tuesday, May 14	30/-	...	60/-
On or before Tuesday, May 28	40/-	...	80/-
Riding and Driving Classes—			
On or before Tuesday, May 28	30/-	...	60/-
Jumping and Pace and Action Classes— including free entry for Consolation Prizes (entries close during the Show)		30/-	
Cattle, Sheep, and Pigs:			
On or before Tuesday, May 14	20/-	...	40/-
On or before Tuesday, May 28	40/-	...	80/-
Poultry:			
On or before Tuesday, May 28	2/6	...	3/6
Produce:			
On or before Tuesday, May 14	2/6	...	3/6
On or before Tuesday, May 28 (except Cider and Perry)	5/-	...	10/-

The Entry Fees above stated include the charge for Hay, Straw, and Green Food for the Live Stock, and Food for the Poultry. Corn, Meal, Cake, &c., can be obtained in the Showyard at fixed prices.

Horse Boxes will only be provided for the Stallions, and for Mares with foals at foot ; for the other Horse Classes Stalls only will be provided. Flooring for a Horse Box will, if required, be provided at an additional charge of 20*s*. Flooring for a Stall will, if required, be provided at an additional charge of 15*s*.

The last day on which Entries of Live Stock and Produce can be accepted at Ordinary Rates will be **Tuesday, May 14, 1907,** but between May 14 and Tuesday, May 28, Entries (except for Cider and Perry) may be tendered at the increased Fees mentioned above. Entries of **Poultry** will be accepted up to **Tuesday, May 28,** at Ordinary Fees.

No Entry Fees for which a receipt has been issued by the Secretary are returnable, but the Society will consider any applications made **not later than May 28** (when the final preparations for the Show have to be made) for the refunding of fees paid in respect of Entries which have been previously made, but which, for causes satisfactory to the Council, cannot be sent to the Show. No such application received after May 28 can be entertained. Complete copies of the Prize Sheet and Regulations will be sent on application to the Secretary, at 16 Bedford Square, London, W.C.

All Entry Fees must be paid by Crossed Cheque or Crossed Postal Orders, made payable to "The Royal Agricultural Society of England," and crossed "London and Westminster Bank."

INDEX TO VOLUME 67.

1906.

The titles of Articles are printed in Italics. The Roman numerals refer to the Appendix.

ABE

ABERDEEN-ANGUS and Shorthorn Cross, in connection with Mendel's Laws, 57
Acarines, 71, 82, 86, 267, 274
Acarus Causing Sheep Scab, 82
Acreage under Crops and Grass in 1906, 313
Agricultural Education and Forestry Exhibition, 1906, 201-213
Agricultural Research, Proposed Council for, 221, xxxix, xl
Agricultural Science, 201
Agricultural Weights and Measures, 106-117
American Gooseberry Mildew, 262, xliv
American Heel Fly, 66
Annual Report for 1906 *of the Consulting Botanist*, 255-265
— *for* 1906 *of the Consulting Chemist*, 242-254
— *for* 1906 *of the Principal of the Royal Veterinary College*, 230-241
— *for* 1906 *of the Zoologist*, 267-281
Anthrax, 230
Apple Trees, Diseased, 272
Apples, Disease of, 259
Application of Mendel's Laws of Inheritance to Breeding Problems, The, 46-63
Asphalt for Road Pavements, 37-40
Asses at Derby Show of 1906, 139
Auction Sales in the Showyard, 133
Autumn of 1906, The, 340
Avoirdupois Scale of Weights, 110
Awards of Prizes at Show of 1906, lvi

BALANCE-SHEET, 1906, xvi, xliv
Barbed Wire, 207
Barley, Continuous Growth of, at Rothamsted, 202; at Woburn, 288
— "Head" and "Tail," 301
— Yield of, in 1905, 311; Acreage of, in 1906, 314
Barrow and Sack Lifter, 187
Beans, Yield of, in 1905, 312; Acreage of, in 1906, 314
Biffen (R. H.), *The Application of Mendel's Laws of Inheritance to Breeding Problems*, 46-63
Binders, 101-105
Blending of Butter, 124, 125
Blue Andalusians produced in accordance with Mendel's Laws, 59
Bot Fly of Cattle, 65; of Sheep, 87
Botanist, Annual Report of Consulting, 255

CLE

Breeding of Live Stock by Mendel's Laws, 47, 55-61
Brewing Measures, 113
Brick Paving of Roads, 36
British Forestry, 211
Brodie (F. J.), *The Weather during the Agricultural Year*, 1905-1906, 333-341
Brown, Sir George, Death of, 215
Bushel, Varying weights of the, 108
Butter and Milk Tests at the Derby Show, 1906, 189-201
Butter at Derby Show of 1906, 150
— Blending of, 124, 125
— Impurities in, 122-126
— Taste of Genuine, compared with Adulterated, 199
Butter Factories, Inspection of, recommended, 126
Butter-making Competitions at Derby Show of 1906, 127
Butter Ratios of different Dairy Breeds, 123, 124
Butter Tests, 189-193
Buttercups in Pastures, 258

CABBAGE, Acreage of, in 1906, 315
Cakes, Feeding, 244
Calcined Ironstone, 253
Cambridge University Agricultural Department, 203
Canadian Wheat, 302
Carrots, Acreage of, in 1906, 316
Carruthers (William), *Annual Report for* 1906 *of the Consulting Botanist*, 255-265
Cattle, A New Disease of, 235
— at Derby Show of 1906, 139
— Crossing of, in connection with Mendel's Laws, 57
— Number of, in 1906, 317
Census Returns of Rural Population, 9
Cheese at Derby Show of 1906, 150
Cheese Measures, 113
Chemist, Annual Report of Consulting, 242
Chicken Manure, 250
Christian of Denmark, The late King, xxvii, xxix
Churning, Old and New Methods of, Compared, 200
Churns, Locking of Railway, 121
Cider at Derby Show of 1906, 150
— Definition of, 1
— Judging of, xxxvi
Cider Institute, 207.
Cleanliness in Milking, 121

CLO
Clover, Acreage of, in 1906, 316
— Varieties of, 309
Codrington (T.), Experiments on roads, 32
Coffee Bean Husk, 247
Coins, Fineuesses of various, 112
Colour in Horses, Inheritance of, 57-59
Committees of Council, Standing, iii
Comparative Economy of Different Methods of Harvesting Corn Crops, 98-106
Compound Cakes, 247
Continuous Growing of Wheat, 282; of Barley, 285, 288
Cope (A. C.), Death of, 215, xxxiii
Corn, Sale of, by Weight, 117
Cornwallis (F. S. W.), Presidency of, xxxvii, xlv, li
— Elected Trustee, 216, xliii
Cotton Cakes, 245
Cotton Seed Manure, 250
Council, List of, i
Council for Agricultural Research, Proposed, xxxix, xl
Cowan (P. C.), *Rural Roads, with Special Reference to Modern Requirements*, 20-45
Cows, Cleanliness in, 119, 120
Cowsheds, Construction of, 119
Craigie (Major P. G.), *The Place of the Small Holder in English Agriculture*, 1-19
Cream at Derby Show of 1906, 150
Cream Separator, 188
Crops, Yield of, 1905, 311, 313; Acreage of, in 1906, 313
Cross (J. P.), Death of, xxviii
Crossing of Poultry in connection with Mendel's Laws, 59
Crossley Bros.' Suction Gas Plant, 164, 183, 223
Currant Bud Moth, 267, 268

DAIRY Factories, Need for Inspection of, 126
Decimal System of Weights and Measures, 114-116
Denmark, Death of King Christian of, xxviii, xxix
Denmark, Rural Population of, 19
Deputation to Board of Agriculture, xxx
Derby Show, 1906, *The*, 127-153
— 223
— Receipts and Expenditure at, xx
Derbyshire Agricultural Society, 127
Dirt in Milk, 121, 122
Disease of Cattle, A New, 235
Diseases of Plants, 259, xliv
Distribution of Governors and Members of the Society, v
Dodder in Foreign Clover, 266
Donations to the Society, xv

HAR
Dorset Horned and Suffolk Sheep, Crossing of, in connection with Mendel's Laws, 55-57
Drain Clearing Apparatus, "Ferret," 189
Dust Nuisance on Roads, 41

ELECTION of Council, xlix
Entry Fees for Horses, Revised, 225, cxxv
— Lincoln Show, 1907, 225, cxxv
Estimate of Receipts and Expenditure, xxviii
Experiments in the Dairy, 198, 201
— Necessity for Care in Pot-culture, 209

FARM Prize Competitions, 225, xxxiv, xxxvi, xliii, cxxiv
Feeding Experiments at Rothamsted, 202
Feeding Stuffs, 244-248
Fence Making Machine, 188
Fertilisers, 242, 248
Fertilisers and Feeding Stuffs Act, 1906, 242, xxxiii
Field Experiments at Woburn, 282-310
Flax, Acreage of, in 1906, 316
Flies as Parasites of Cattle, 65; of Sheep, 80
Flue Dust, 252
Flukes in Cattle, 78; in Sheep, 90-95
Forestry at Derby Show of 1906, 211
Fowl Cholera, 233
France, Control of Roads in, 20, 25
— Rural Population of, 17, 18
Frankish (W.), Resignation of, 215, xxv
Fruit, Acreage of, in 1906, 316

GERMANY, Small Holdings in, 10-14
Gid, Sturdy, &c., 96
Gilmour (Sir John), Resignation of, 215
Glanders, 231
Godfrey (Ernest H.), *Agricultural Education and Forestry Exhibition*, 1906, 201-213
Gold and Silver, Hardening of, 112
Gooseberries, Diseases of, 262, xliv
Gooseberry Mildew, American, 262, xliv
Governors of the Society, List of, vii
— Number of, since Establishment of Society, xxiv
Grass Experiments, 209
Grass and Clover, Acreage of, in 1906, 316
Green-manuring Experiment, 299
Ground Lime, 251
Guano, Peruvian, 248
Güssow (H. T.), *International Seed-Testing Conference at Hamburg*, 1906, 265-267

HAND Drag Rake, 187
Hardening of Gold and Silver, 112

HAR
Harvest Bug or Scarlet Mite, 87
Harvesting of Corn Crops, 98-106
Hay, Weights of, 109
— Yield of, in 1905, 313
"Head" and "Tail" Barley, 301
Hides damaged by Warbles and Wire, 207
Hippisley (Bayntun), *Miscellaneous Implements Exhibited at Derby*, 1906, 185-189
Hives at Derby Show of 1906, 152
Honey at Derby Show of 1906, 152
Hoose in Cattle, 78
Hops, Yield of, in 1905, 313; Acreage of, in 1906, 316
Hornizing of roads, 36
Horse-shoeing Competitions at Derby Show of 1906, 153
Horses at Derby Show of 1906, 134
— Number of, in 1906, 317
— Inheritance of Colour in, 57-59
Horticultural Exhibition at Derby, 127
House, Sale of Society's, xxxiii, xxxviii, xxxix, xl
Humane Rabbit Trap, 187
Husk in Cattle, 78
Hypoderma bovis, 66; H. lineata, 66

IMPLEMENTS at Derby Show of 1906, 185-189
Importation of Cattle, Restrictions against, 227, xxx
Impurities in Milk and Butter, 118-126
Increased Annual Subscriptions and Donations, xiii
Inheritance of Colour in Horses, 57-59
Inoculation of Milk, 206
Inspection of Dairy Factories, Need for, 126
International Seed-Testing Conference at Hamburg, 1906, 265-267
Ipswich, Invitation from, for Show of 1907, 224, xxxiv
Ironstone, Calcined, 253

JAVA Beans, 243, 247
Johne's Disease, 235
Judges at Show of 1906, lii

KAINS-JACKSON (Charles), *Agricultural Weights and Measures*, 106-117
Ked in Sheep, 81, 86
King (H.M. The), Visit to Derby Show of, 129-131
Kingscote (Sir Nigel), Resignation of, 216, xl
Kleinpflaster, or Small Paving of Roads, 36, 37
Kohl Rabi, Acreage of, in 1906, 316

LAWES Agricultural Trust, 201.
Leather damaged by Warbles and Barbed Wire, 207
Lice on Cattle, 68; on Sheep, 80

NAT
"Licked Beef," 66
Lime, Ground, 251
Lime, Influence of, 208
Lime Waste from Boiler Water, 252
Lincoln Show, 1907, 224, xxxviii, cxvii, cxxv
Linseed Cake, 244
Liver Fluke of Cattle, 78; of Sheep, 90
Liver Rot in Sheep, 90
Lucerne, 308; Varieties of, 309
— Acreage of, in 1906, 316

MACADAM as a Road Maker, 29, 30
McFadyean (Sir John), *Annual Report for* 1906 *of the Principal of the Royal Veterinary College*, 230-241
McRow (Thomas), *The Derby Show*, 1906, 127-153
Maggot of Sheep, 80
Magnesia, Influence of, 208
Mange in Cattle, 69; in Sheep, 86
Mangels, Experiments on, at Rothamsted, 202
— Late Pulling of, 307
— Nitrate of Soda and Salt for, 306
— Yield of, in 1905, 312; Acreage of, in 1906, 315
Mangers in Cowsheds, Height of, 119, 120
Manures, 248
Mathews (Ernest), *Butter and Milk Tests at the Derby Show*, 1906, 189-201
— *Impurities in Milk and Butter*, 118-126
Measures, Agricultural, 106
Members on Register, xii
— Number of, since Establishment of Society, xxiv
Memoranda, 342
Mendel (Gregor Johann), Life of, 46
Mendel's Laws of Inheritance, 203, 204
— The Application of, to Breeding Problems, 46-63
Midland Agricultural and Dairy College, 206.
Milk, Impurities in, 118-122
— Inoculation of, 206
— Wholesale prices of, 123
Milk-yield Tests, 193-198
Milking, Cleanliness in, 121
Miscellaneous Implements Exhibited at Derby, 1906, 185-189
Mite causing Sheep Scab, 82
Mites, Destruction of, by Heat, 273
More, R. Jasper, M.P., The late, 117
Motor Cars in relation to Roads, 22, 28, 42
Motor, Universal, 185
Mowing of Corn, 100
Mower and Swath Turner, Combined, 187

NATIONAL Council of Agricultural Research, Proposed, 221, xxxix, xl
National Gas Engine Company's Suction Gas Plant, 162, 183, 223

NAT
National Fruit and Cider Institute, 207
Nature Study in Rural Schools, 209
Nitrate of Soda for Mangels, 306
Nitrogen Assimilation, 206

OATS, Yield of, in 1905, 311 ; Acreage of, in 1906, 314
Officials and Judges at Show of 1906, lii
— of Society, iv
Oil from Castor Oil Plant and Sunflowers, 264
Ox Warble or Bot Fly, 65

PARASITES of Cattle and Sheep, 64-97
Parasitic Bronchitis in Cattle, 78; in Sheep, 95
— Gastritis of Cattle, 74 ; of Sheep, 88
— Pneumonia in Sheep, 95
Park Royal Estate, Sale of, 222, xxv, xxxii
Pear Midge, 267, 271
Pear Rust, 261
Peas, Yield of, in 1905, 312; Acreage of, in 1906, 314
Pediculi in Sheep, 80
Penberthy (John), *Parasites of Cattle and Sheep*, 64-97
Perry at Derby Show of 1906, 150
Peruvian Guano, 248
Phosphate, Raw, 251
Pigs at Derby Show of 1906, 148
— Number of, in 1906, 332
Place of the Small Holder in English Agriculture, The, 1-19
Plant Breeding Experiments, 46, 203
Plants, Diseases of, 259, xliv
Potash Manuring for Potatoes, 305
Pot-culture Experiments, Necessity for Care in, 209
Potatoes, Potash Manuring for, 305
— Yield of, in 1905, 312; Acreage of, in 1906, 315
Poultry at Derby Show of 1906, 149
— Crossing of, in connection with Mendel's Laws, 59, 204
Press View of Showyard, 1
Principal Regulations as to Entry Fees, &c., Lincoln Show, 1907, cxxv
Prize List for Lincoln Show, 1907, xli, cxvii
Proceedings of the Council in 1906: Jan. 10, xxv ; Feb. 7, xxvii ; Mar. 7, xxix; April 4, xxxii ; May 2, xxxiii ; May 30, xxxiii ; June 29, xxxviii ; Aug 1, xxxviii ; Nov. 7, xl ; Dec. 12, xliv.
— at Deputation to Board of Agriculture : Mar. 6, 1906, xxx
— at General Meetings in 1906 : June 28, xxxiv ; Dec. 12, xlvi.
Psorospermosis, 234

RABBIT Trap, 187
Railway Churns, Locking of, 121
Railway Fares to Shows, 1
Rainfall of 1906, The, 336, 337

SIL
Rainfall at Woburn, 1905, 1906, 310
Rake, Hand Drag, 187
Rangoon Beans, 243, 247
Rape, Acreage of, in 1906, 316
Raw Phosphate, 251
Reaping by Hand, 99 ; by Machinery, 101-105
Reaping Machines, 101-106
Redwater of Cattle, 71
Refuse Manures, 249
Report of Council to General Meeting, December, 1906, 214-229
— of Special Committee, September, 1905, 218
Research Laboratory, 230
Ringworm of Cattle, 73
Roads, with Special Reference to Modern Requirements, Rural, 20-45
— List of Publications on, 45
Rolling of Roads, 35
Rot in Sheep, 90-95
Rotation Experiments, 291 ; at Rothamsted, 202
Rothamsted Experimental Station, 201
Royal Agricultural College, 203
Royal Agricultural Society's Exhibit at Agricultural Education Exhibition, 208
Royal Commission on Motor Cars, 1906, 22, 28, 42
Rural Roads, with Special Reference to Modern Requirements, 20-45
Rye, Acreage of, in 1906, 314
Ryland (H. P.), Death of, 214, xxv

SACK Lifter and Barrow, 187
Sale of Corn by Weight, 117
Salt, Effect of, on Germination, 206
— for Mangels, 306
Sankey (Capt. H. Riall), *The Trials of Suction Gas Plants at Derby*, 1906, 154-184.
Sarcoptic Mange, 86
Scab in Sheep, 82
Scabies or Mange of Cattle, 69
Scarlet Mite or Harvest Bug, 87
School Gardens, 210
Section Remover, 186
Seed-Testing Conference at Hamburg, 1906, 265
— Station, National, 1
Seeds, Vitality in Farm, 257
Self-Binders, 101-105
Separator, Cream, New, 188
"Sharps," Adulterated, 247
Sheep, Crossing of, in connection with Mendel's Laws, 55-57
— at Derby Show of 1906, 144
— Number of, in 1906, 317
Sheep Scab, 82, 85
Shorthorn-Aberdeen Angus Cross, in connection with Mendel's Laws, 57
Show of 1907, 224, xxxiv, xxxviii, xli, cxvii, cxxv
Silver and Gold, Hardening of, 112
Sites Committee, Appointment of xl

SLA
Slaughter of Cattle at Port of Debarkation, 227, xxx
Small Holder in English Agriculture, The Place of the, 1-19
Small Holdings, Report of the Departmental Committee on, 1-6
Soils, 253
Soot, 251
— as a Top-dressing for Wheat, 304
South Eastern Agricultural College, 205
Spring of 1906, The, 335
Stalls in Cowsheds, 119, 120
Statements of Receipts and Expenditure, xviii, xxviii
— at the Derby Show of 1906, xx
Statistics affecting British Agricultural Interests, 311-332
Strongyles in Cattle, 78; in Sheep, 95
Sturdy, Gid, &c., 96
Subscriptions and Donations, List of Increased, xiii
Suction Gas Plants at Derby, 1906, Trials of, 154-184, 223
Suffolk and Dorset Horned Sheep, Crossing of, in connection with Mendel's Laws, 55-57
Summer of 1906, The, 338
Sunflowers for Production of Oil, 264
Sunshine of 1906, Bright, 336
Swath Turner combined with Mower, 187
Swine Fever, 232
Symbiotic Mange, 86

TAPEWORMS of Cattle, 77
Tar Macadam, 43, 44
Tares, Acreage of, in 1906, 316
Telford as a Road Maker, 29, 30
Temperature of 1906, The, 336
Texan Fever of Cattle, 71
Thomas (A. P.), Researches of, into Life-history of Liver Fluke, 92
Ticks, 267, 274; of Cattle, 71; of Sheep, 86
Tile Press, Steam, 187
Trials of Suction Gas Plants at Derby, 1906, The, 154-184
Turnips, Yield of, in 1905, 312; Acreage of, in 1906, 315
Twine, Consumption of, for Binders, 101-105
Tyres of Cart Wheels, Width of, 40

ZOO
UNIVERSAL Motor, 185

"VIAGRAPH," The, 45
Vetches, Acreage of, in 1906, 316
Veterinary College, Annual Report of, 230
— Grant to, xxvii
Vitality in Farm Seeds, 257
Voelcker (Dr. J. A.), *Annual Report for 1906 of the Consulting Chemist*, 242-254
— *The Woburn Experimental Station of the Royal Agricultural Society of England*, 282-310

WARBLES in Cattle, 65; in Sheep, 87
Warbled Hides, 207
Warburton (Cecil), *Annual Report for 1906 of the Zoologist*, 267-281
Weather during the Agricultural Year, 1905-1906, The, 333-341
Weights and Measures, Agricultural, 106-117
Wheat, Canadian, 302
— Continuous Growth of, at Rothamsted, 201; at Woburn, 282
— Mendelian Experiments with Different Varieties of, 47-55
— Yield of, in 1905, 311; Acreage of, in 1906, 313
Wheel for Wheelbarrow, Patent, 187
Winter of 1905-1906, The, 333
Wire, Barbed, 207
Woburn Experimental Station, 208
Woburn Experimental Station of the Royal Agricultural Society of England, The, 282-310
Wood-paving of Roads, 39
Wool at Derby Show of 1906, 151
Wool Measures, 113
Worms in Cattle, 77, 78; in Sheep, 80
Wrightson (John), *Comparative Economy of Different Methods of Harvesting Corn Crops*, 98-106

YARBOROUGH (Earl of), Presidency of, xlv, xlviii

ZOOLOGIST, Annual Report of, 267

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Royal Agricultural Society of England.

INCORPORATED BY ROYAL CHARTER 26th MARCH, 1840.

PRESIDENT FOR 1907:

THE EARL OF YARBOROUGH.

Terms and Privileges of Membership.

SUBSCRIPTIONS.—1. *Annual.*—The minimum subscription of a Governor is £5 and that of a Member £1, due in advance on the 1st of January of each year, and becoming in arrear if unpaid by the 1st of June.

2. *For Life.*—Governors may compound for their subscriptions for future years by paying at once the sum of £50, and Members by paying £15. After payment of ten or more annual subscriptions, a Member may compound for future subscriptions, including that of the current year, by a single payment of £10; and after payment of twenty or more annual subscriptions, by a single payment of £5—or £25 in the case of Governors.

ELECTION OF NEW MEMBERS.—Every candidate for admission into the Society must be proposed by a Member, who must specify in writing the full name, occupation, and usual place of residence of the candidate. Forms of proposal may be obtained on application to the Secretary, who will inform new Members of their election by letter.

PRIVILEGES OF MEMBERSHIP:—

General Privileges, page II.

Chemical, pages III to V. | *Zoological*, page VII.
Botanical, pages VI and VII. | *Veterinary*, page VIII.

The Society at present consists of about 9,700 Members.

All communications as to Membership or on the general business of the Society should be addressed to the Secretary, at 16 Bedford Square, London, W.C.

THOMAS McROW,
Secretary.

16 BEDFORD SQUARE, W.C.
February, 1907.

Telegraphic Address: "PRACTICE, LONDON." Telephone Number: "3675 GERRARD."

General Privileges of Governors and Members.

FREE ADMISSION TO SHOWS.

The Society holds every year an Exhibition of Live Stock, Farm Produce, and Implements, to which, and to the Grand Stands at the Horse Ring, Dairy, and elsewhere, Members are entitled to free admission. The Show of 1907 will be held at Lincoln, from June 25-29.

REDUCED RATES FOR ENTRY OF LIVE STOCK AND IMPLEMENTS.

No entry fee is charged to Members exhibiting Implements at the Shows. Firms and Companies may secure these privileges by the Membership of one or more of their partners. Entries of Horses, Cattle, Sheep, Pigs, Poultry, Produce, &c., can be made by Members at reduced rates.

SOCIETY'S JOURNAL AND OTHER PUBLICATIONS.

Every Member is entitled to receive, without charge, a copy of the Journal of the Society, each Volume of which contains articles and communications by leading authorities on the most important agricultural questions of the day, together with official reports by the Society's Scientific Advisers and on the various departments of the Annual Shows, and other interesting features.

Copies of the Journal may be obtained by Non-Members of the Publisher, Mr. JOHN MURRAY, 50A Albemarle Street, W., at the price of ten shillings per copy. Copies of the Society's pamphlets, sold at not less than One Shilling each, are obtainable by Members at half price on direct application to the Secretary.

LIBRARY AND READING ROOM.

The Society has a large and well-stocked library of standard books on agricultural subjects. A Reading Room is provided, at which the principal agricultural newspapers and other periodicals can be consulted by Members during office hours (10 a.m. to 4 p.m.; Saturdays, 10 a.m. to 2 p.m.).

CHEMICAL PRIVILEGES.

The Society makes annually a considerable grant from its general funds in order that Members may obtain at low rates analyses of feeding stuffs, fertilisers, soils, &c., by the Society's Consulting Chemist (Dr. J. AUGUSTUS VOELCKER, Analytical Laboratory, 22 Tudor Street, London, E.C.). Members may also consult Dr. VOELCKER either personally or by letter at a small fee.

VETERINARY PRIVILEGES.

Members can consult the Professors of the Royal Veterinary College at fixed rates of charge, and they have the privilege of sending Cattle, Sheep, and Pigs to the College Infirmary on the same terms as subscribers to the College.

BOTANICAL PRIVILEGES.

Reports can be obtained by Members from the Society's Consulting Botanist (Mr. W. CARRUTHERS, F.R.S., The Laboratory, 44 Central Hill, Norwood, S.E.) on the purity and germinating power of seeds, and on diseases or weeds affecting farm crops, at a fee of one shilling in each case.

ZOOLOGICAL PRIVILEGES.

Information respecting any animal (quadruped, bird, insect, worm, &c.) which, in any stage of its life, affects the farm or rural economy generally, with suggestions as to methods of prevention and remedy in respect to any such animal that may be injurious, can be obtained by Members from the Society's Zoologist (Mr. CECIL WARBURTON, M.A., The Zoological Laboratory, Cambridge) at a fee of one shilling in each case.

GENERAL MEETINGS OF GOVERNORS AND MEMBERS.

The Annual General Meeting of Governors and Members is held in London during the week of the Smithfield Club Show. A General Meeting is usually held also in the Showyard during the week of the Show.

SPECIAL PRIVILEGES OF GOVERNORS.

In addition to the privileges of Members, as described above, Governors are entitled to an extra copy of each Volume of the Journal, to attend and speak at all meetings of the Council, and are alone eligible for election as President, Trustee, and Vice-President. The minimum Annual Subscription of a Governor is £5, with a Life Composition of £50; and of a Member, £1, with a Life Composition of £15.

Governors' and Members' Privileges of Chemical Analysis.

(*Applicable only to the case of persons who are not commercially engaged in the manufacture or sale of any substance sent for Analysis.*)

The Council have fixed the following rates of Charges for Chemical Analysis to Members of the Society.

These privileges are applicable only when the analyses are for *bonâ fide* agricultural purposes, and are required by Members of the Society for their own use and guidance in respect of farms or land in their own occupation and within the United Kingdom.

The analyses are given on the understanding that they are required for the individual and sole benefit of the Member applying for them, and must not be used for other persons, or for commercial purposes.

The analyses and reports may not be communicated to either vendor or manufacturer, except in cases of dispute.

Land or estate agents, bailiffs, and others, when forwarding samples, are required to state the names of those Members on whose behalf they apply.

	£	*s.*	*d.*
1.—An opinion on the purity of any Fertiliser or Feeding Stuff (so far as this can be given without detailed analysis) . .	0	1	0
2.—Determination of any *one* constituent in a Fertiliser or Feeding Stuff	0	2	6
3.—Commercial analysis of any ordinary Fertiliser or Feeding Stuff	0	5	0
4.—Full Analysis of any compound Fertiliser or Feeding Stuff .	0	10	0
5.—Analysis of any other material in ordinary use for agricultural purposes.	0	10	0
6.—Analysis of Milk, Cream, Butter, or other Dairy produce from Members' own farms	0	2	6
(N.B.—Samples in any way connected with the Sale of Food and Drugs Acts are not undertaken for analysis.)			
7.—Analysis of Water	1	10	0
8.—Analysis of Soil—determination of Lime only	0	10	0
9.—Analysis of Soil—partial	1	0	0
10.—Analysis of Soil—complete	3	0	0
11.—Consultation by letter or personal appointment . . .	0	5	0

Together with the analysis will be given, as far as possible, an opinion as to whether an article analysed is worth the price asked for it, or not, provided the cost of the same, together with guarantee (if any) and other particulars relating to the purchase, be given at the time.

All samples and communications, together with fees for analysis, to be addressed to—Dr. VOELCKER, Analytical Laboratory, 22 Tudor Street, London, E.C.

A pamphlet containing Suggestions as to the Purchase of Fertilisers and Feeding Stuffs, and Instructions for selecting and forwarding Samples for Analysis, will be sent to any Member on application to the Secretary, from whom also may be obtained Forms of Order for Fertilisers and Feeding Stuffs.

Instructions for Selecting and Sending Samples for Analysis.

GENERAL RULES.—(1.) A sample taken for analysis should be fairly *representative of the bulk* from which it has been drawn.—(2.) The sample should reach the Analyst *in the same condition* that it was in at the time when drawn.

When **Fertilisers** are delivered in bags, select four or five of these from the bulk, and either turn them out on a floor and rapidly mix their contents, or else drive a shovel into each bag and draw out from as near the centre as possible a couple of shovelfuls of the manure, and mix these quickly on a floor.

Halve the heap obtained in either of these ways, take one half (rejecting the other) and mix again rapidly, flattening down with the shovel any lumps that appear. Repeat this operation until at last only some three or four pounds are left.

From this fill three tins, holding from ½lb. to 1lb. each, mark, fasten up and seal each of these. Send one for analysis, and retain the others for reference.

Or,—the manure may be put into glass bottles provided with well-fitting corks; the bottles should be labelled and the corks sealed down. The sample sent for analysis can be packed in a wooden box and sent by post or rail.

When manures are delivered in bulk, portions should be successively drawn from *different parts* of the bulk, the heap being turned over now and again. The portions drawn should be thoroughly mixed, subdivided, and, finally, samples should be taken as before, except that when the manure is coarse and bulky it is advisable to send larger samples than when it is in a finely divided condition.

Linseed, Cotton, and other Feeding Cakes.—If a single cake be taken, three strips should be broken off right across the cake, and from the middle portion of it, one piece to be sent for analysis, and the other two retained for reference. Each of the three pieces should be marked, wrapped in paper, fastened up, and sealed. The piece forwarded for analysis can be sent by post or rail.

A more satisfactory plan is to select four to six cakes from different parts of the delivery, then break off a piece about four inches wide from the middle of each cake, and pass these pieces through a cake-breaker. The broken cake should then be well mixed and three samples of about 1 lb. each should be taken and kept in tins or bags, duly marked, fastened, and sealed as before. One of these lots should be sent for analysis, the remaining two being kept for reference. It is advisable also with the broken pieces to send a small strip from an unbroken cake.

Feeding Meals, Grain, &c.—Handfuls should be drawn from the centre of half a dozen different bags of the delivery; these lots should then be well mixed, and three ½-lb. tins or bags filled from the heap, each being marked, fastened up, and sealed. One sample is to be forwarded for analysis and the others retained for reference.

Soils.—Have a wooden box made 6 inches in length and width, and from 9 to 12 inches deep, according to the depth of soil and subsoil of the field. Mark out in the field a space of about 12 inches square; dig round in a slanting direction a trench, so as to leave undisturbed a block of soil and its subsoil 9 to 12 inches deep; trim this block to make it to fit into the wooden box, invert the open box over it, press down firmly, then pass a spade under the box and lift it up, gently turn over the box, nail on the lid, and send by rail. The soil will then be received in the position in which it is found in the field.

In the case of very light, sandy, and porous soils, the wooden box may be at once inverted over the soil, forced down by pressure, and then dug out.

Waters.—Samples of water are best sent in glass-stoppered Winchester bottles, holding half a gallon. One such bottle is sufficient for a single sample. Care should be taken to have these scrupulously clean. In taking a sample of water for analysis it is advisable to reject the first portion drawn or pumped, so as to obtain a sample of the water when in ordinary flow. The bottle should be rinsed out with the water that is to be analysed, and it should be filled nearly to the top. The stopper should be secured with string, or be tied over with linen or soft leather. The sample can then be sent carefully packed either in a wooden box with sawdust, &c., or in a hamper with straw.

Milk.—A pint bottle should be sent in a wooden box.

GENERAL INSTRUCTIONS. Time for Taking Samples.—All samples, both of fertilisers and feeding stuffs, should be taken as soon after their delivery as possible, and should reach the Analyst within *ten days* after delivery of the article. In every case it is advisable that the Analyst's certificate be received before a fertiliser is sown or a feeding stuff is given to stock.

Procedure in the Event of the Vendor wishing Fresh Samples to be Drawn.—Should a purchaser find that the Analyst's certificate shows a fertiliser or feeding stuff not to come up to the guarantee given him, he may inform the vendor of the result and complain accordingly. He should then send to the vendor *one* of the two samples which he has kept for reference. If, however, the vendor should demand that a fresh sample be drawn, the purchaser must allow this, and also give the vendor an opportunity of being present, either in person or through a representative whom he may appoint. In that case three samples should be taken in the presence of both parties with the same precautions as before described, *each* of which should be duly packed up, labelled and *sealed* by both parties. One of these is to be given to the vendor, one is to be sent to the Analyst, and the third is to be kept by the purchaser for reference or future analysis if necessary.

Suggestions to Purchasers of Fertilisers and Feeding Stuffs.

Purchasers are recommended in all cases to insist on having an **INVOICE,** and to see that such invoice contains the following particulars:—

In the case of **Fertilisers:**—

(1) The *name* of the Fertiliser.
(2) Whether the Fertiliser is artificially *compounded* or not.
(3) The *minimum* analysis of the Fertiliser in respect of its principal fertilising ingredients.

In the case of artificially prepared **Feeding Stuffs** for Cattle:—

(1) The *name* of the article.
(2) The *description* of the article—whether it has been prepared (*a*) from one substance or seed, or (*b*) from more than one substance or seed.

For example:

(*a*) An invoice describing an article as "Linseed Cake" implies a warranty that the article is pure, *i.e.*, is prepared from linseed only; "Cotton Cake" (whether decorticated or undecorticated), and "Rape Cake" (for feeding purposes), would come under a similar category.

Purchasers are reminded that the use of such terms as "95 per cent.," "Oil Cake," &c., affords no security against adulteration. The adoption of the ORDER FORM *issued by the Society is therefore strongly recommended.*

(*b*) In the case of a Compound Cake or Feeding Stuff, a Vendor is only compelled by the Fertilisers and Feeding Stuffs Act of 1893 to state that it is prepared from more than one substance, and he is not required to specify the particular materials used in its preparation. Purchasers are recommended, therefore, to buy Mixed Feeding Cakes, Meals, &c., with a guaranteed analysis. Any statements in the invoice as to the component parts of such Mixed Cake or Meal will take effect as a warranty, as also will any statements in an invoice, circular, or advertisement as to the percentages of nutritive and other ingredients in any article sold for use as food for cattle.

Members of the Society are strongly recommended not only to see that the invoices given to them accurately describe the goods they have ordered, but to make all their orders *subject to the Analysis and Report of the Consulting Chemist of the Royal Agricultural Society of England.* Copies of a Form of Order for this purpose may be obtained on application to the Secretary.

Attention is particularly directed to the recommendations below as to the qualities of Fertilisers and Feeding Stuffs which purchasers should demand.

Conditions of Purchase and Sale.

FERTILISERS.

Raw Bones, Bone-meal, or Bone-dust to be guaranteed "PURE," and to contain not less than 45 per cent. of Phosphate of Lime, and not less than 4 per cent. of Ammonia.

Steamed or "Degelatinised" Bones to be guaranteed "PURE," and to contain not less than 55 per cent. of Phosphate of Lime, and not less than 1 per cent. of Ammonia.

Mineral Superphosphate of Lime to be guaranteed to contain a certain percentage of "Soluble Phosphate." [From 25 to 28 per cent. of Soluble Phosphate is an ordinarily good quality.]

Dissolved Bones to be guaranteed to be "made from raw bone and acid only," and to be sold as containing stated minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia.

Compound Artificial Manures, Bone Manures, Bone Compounds, &c., to be sold by analysis stating the minimum percentages of Soluble Phosphate, Insoluble Phosphates, and Ammonia contained.

Basic Slag to be guaranteed to be sufficiently finely ground that 80 to 90 per cent. passes through a sieve having 10,000 meshes to the square inch, and to contain a certain percentage of Phosphoric Acid or its equivalent in Phosphate of Lime. [The highest grades range from 17 to 20 per cent. of Phosphoric Acid; medium grades 14 to 16 per cent.; and low grades from 10 to 12 per cent. of Phosphoric Acid.]

Peruvian Guano to be described by that name, and to be sold by analysis stating the minimum percentages of Phosphates and Ammonia.

Sulphate of Ammonia to be guaranteed "PURE," and to contain not less than 24 per cent. of Ammonia.

Nitrate of Soda to be guaranteed "PURE," and to contain 95 per cent. of Nitrate of Soda.

Kainit to be guaranteed to contain 23 per cent. of Sulphate of Potash.

All Fertilisers to be delivered in good and suitable condition for sowing.

FEEDING STUFFS.

Linseed Cake, Cotton Cake (Decorticated and Undecorticated), and **Rape Cake** (for feeding purposes) to be pure, *i.e.*, prepared *only* from the one kind of seed from which their name is derived; and to be in sound condition. The Report of the Consulting Chemist of the Royal Agricultural Society of England to be conclusive as to the "purity" or otherwise of any feeding stuffs.

Mixed Feeding Cakes, Meals, &c., to be sold on a guaranteed analysis, to be sound in condition, and to contain nothing of an injurious nature, or ingredients that are worthless for feeding purposes.

Members' Botanical Privileges.

The Council have fixed the following rates of charge for the examination of Plants and Seeds by the Society's Consulting Botanist.

The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

1.—A report on the purity, amount, and nature of foreign materials, the perfectness and germinating power of a sample of seed . . 1*s.*

2.—Determination of the species of any weed or other plant, or of any epiphyte or vegetable parasite, with a report on its habits, and the means for its extermination or prevention . . . . . 1*s.*

3.—Report on any disease affecting farm crops . . . . . 1*s.*

4.—Determination of the species of a collection of natural grasses found in any district, with a report on their habits and pasture value . 5*s.*

N.B.—The Consulting Botanist's Reports on Seeds are furnished to enable Members—purchasers of seeds and corn for agricultural or horticultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes.

PURCHASE OF SEEDS.

The purchaser should obtain from the vendor, by invoice or other writing, the proper designation of the seeds he buys, with a guarantee of the percentage of purity and germination, and of its freedom from ergot, and, in the case of clover, from the seeds of dodder and broom-rape.

It is strongly recommended that the purchase of *prepared mixtures* of seeds should be avoided. The different seeds should be purchased separately and mixed by the farmer. Mixtures cannot be tested for germination.

Copies of an "Order Form and Conditions of Purchase and Sale of Seeds" may be obtained by Members on application to the Secretary, at 16 Bedford Square, London, W.C.

THE SAMPLING OF SEEDS.

The utmost care should be taken to secure a fair and honest sample. This should be drawn from the bulk delivered to the purchaser, and not from the sample sent by the vendor.

When legal evidence is required, the sample should be taken from the bulk, and placed in a sealed bag in the presence of a witness. Care should be taken that the sample and bulk be not tampered with after delivery, or mixed or brought in contact with any other sample or bulk.

At least one ounce of grass and other small seeds should be sent, and two ounces of cereals and the larger seeds. When the bulk is obviously impure, the sample should be at least double the amount specified. Grass seeds should be sent at least four weeks, and seeds of clover and cereals two weeks before they are to be used.

The exact name under which the sample has been sold and purchased should accompany it.

Members' Botanical Privileges—*continued.*

REPORTING THE RESULTS.

The Report will be made on a schedule in which the nature and amount of impurities will be stated, and the number of days each sample has been under test, with the percentage of the seeds which have germinated.

"Hard" clover seeds, though not germinating within the time stated, will be considered good seeds, and their percentage separately stated.

The impurities in the sample, including the chaff of the species tested, will be specified in the schedule, and only the percentage of the pure seed of that species will be reported upon; but the REAL VALUE of the sample will be stated. The Real Value is the combined percentages of purity and germination, and is obtained by multiplying these percentages and dividing by 100; thus in a sample of Meadow Fescue having 88 per cent. purity and 95 per cent. germination, 88 multiplied by 95 gives 8,360, and this divided by 100 gives 83·6, the Real Value.

SELECTING SPECIMENS OF PLANTS.

When a specimen is sent for determination, the whole plant should be taken up and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. They should be placed in a bottle, or packed in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

Parcels or letters containing seeds or plants for examination (carriage or postage prepaid) must be addressed to Mr. W. CARRUTHERS, F.R.S., The Laboratory, 44 Central Hill, Norwood, London, S.E.

Members' Zoological Privileges.

The Council have fixed the charge of 1*s.* for information respecting any animal (quadruped, bird, insect, worm, &c.) which, in any stage of its life affects the farm or rural economy generally, with suggestions as to methods of prevention and remedy in respect to any such animal which may be injurious.

In inquiries concerning injuries, specimens of the injury done should accompany the animal supposed to cause it.

All specimens should be sent in tin or wooden boxes, or in quills, so as to prevent injury in transmission, and must be accompanied by the prescribed fees.

Parcels or letters containing specimens (carriage or postage paid) must be addressed to Mr. CECIL WARBURTON, M.A., Zoological Laboratory, Cambridge.

Members' Veterinary Privileges.

I.—ADMISSION OF SICK OR DISEASED ANIMALS TO THE ROYAL VETERINARY COLLEGE.

1. Members of the Society have all the privileges of subscribers to the Royal Veterinary College, Camden Town, N.W., so far as the admission for treatment of Cattle, Sheep, and Swine is concerned, without being called upon to pay the annual subscription to the College of two guineas. The charges made by the College for keep and treatment are as follows :—Cattle, 10*s.* 6*d.*, and Sheep and Pigs, 3*s.* 6*d.* per week for each animal.

2. The full privileges of subscribers, including the examination of horses, and the admission of horses and dogs into the College Infirmary for surgical or medical treatment, on payment of the cost of keep, will be accorded to Members of the Society on payment of a subscription to the College of one guinea instead of two guineas per annum.

II.—FEES FOR CONSULTATIONS, ANALYSES, AND EXAMINATIONS AT THE ROYAL VETERINARY COLLEGE.

The following fees are payable by Members of the Society for services performed at the Royal Veterinary College on their behalf in cases where a visit to the locality is not involved:—

	£	*s.*	*d.*
Personal consultation with a Veterinary Professor	0	10	6
Consultation by letter	0	10	6
Post-mortem examination of an animal, and report thereon . .	1	1	0
Chemical Examination of viscera for any specified metallic poison .	0	10	6
Chemical Examination of viscera for metallic poisons . . .	1	0	0
Chemical Examination of viscera for vegetable poisons . . .	1	0	0
Chemical Examination of viscera complete, for metals and alkaloids	2	0	0

(The above fees do not apply to cases which involve a visit to the locality.)

III.—INVESTIGATION OF OUTBREAKS OF DISEASE AMONG FARM STOCK.

1. In the event of an outbreak of disease among Cattle, Sheep, or Swine occurring on the farm of any Member of the Society, application should at once be made to the Principal of the Royal Veterinary College, Camden Town, London, N.W.

2. The Principal will then instruct an officer of the College to inquire into the outbreak and report to him. He will also fix the amount of remuneration to be paid to the Inspector, whose professional fee will in no case exceed two guineas per day, exclusive of the actual cost of travelling and maintenance.

3. When it appears on the report of the Inspector selected that the outbreak was of an important character, or of general interest, the cost of the investigation will be defrayed by the Royal Veterinary College.

4. An annual grant is made by the Society to the Royal Veterinary College in aid of the further development of Cattle Pathology. In order to assist the authorities of the College in making the necessary investigations, Members of the Society are particularly requested to send to the College any diseased animals (cattle, sheep, or swine) which they would otherwise destroy as useless, and also any specimens of diseased parts of an unusual character. In the event of living animals being sent, it will be necessary to telegraph to the College at Camden Town the time of their arrival at a London station, so that a van may be sent to meet them. The expense of transit will be defrayed by the Royal Veterinary College.

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THE

JOURNAL

OF THE

ROYAL AGRICULTURAL SOCIETY OF ENGLAND.

VOLUME THE SIXTY-SEVENTH.

PRACTICE WITH SCIENCE.

LONDON:
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1906.

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6/6 per bottle; 5 bottles, 30/-; or 12 Bottles, £3. Carriage paid.

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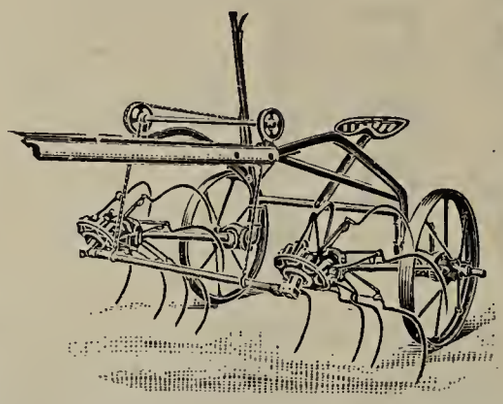

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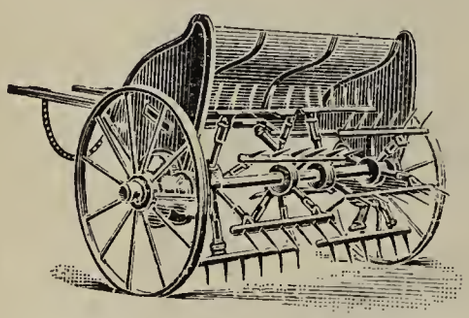

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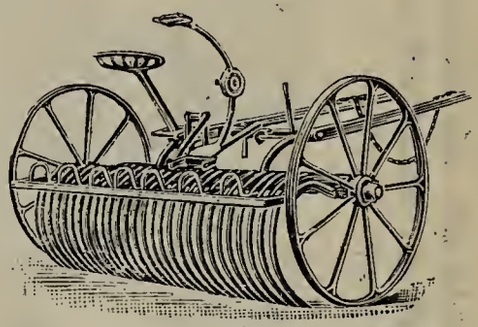

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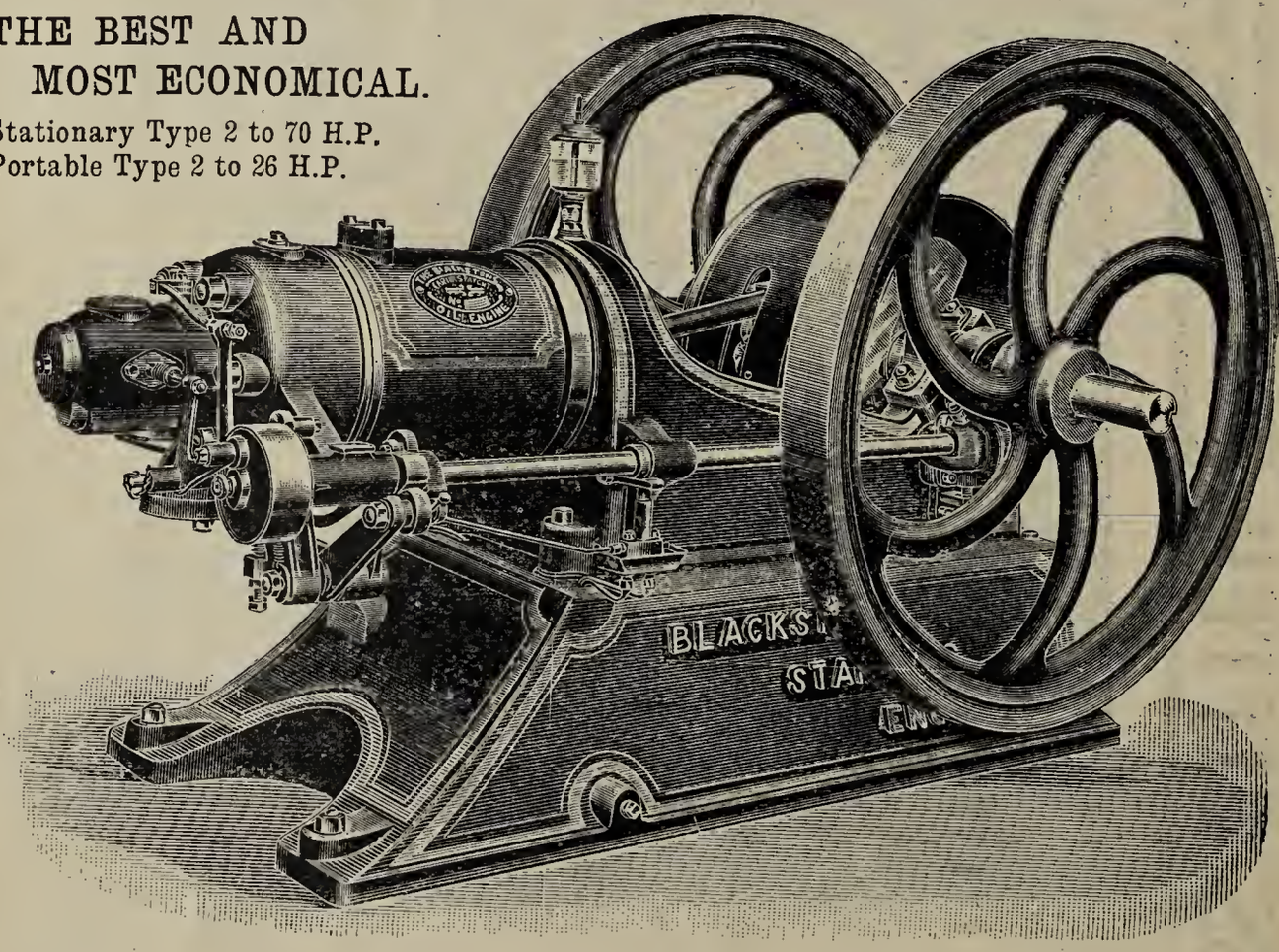

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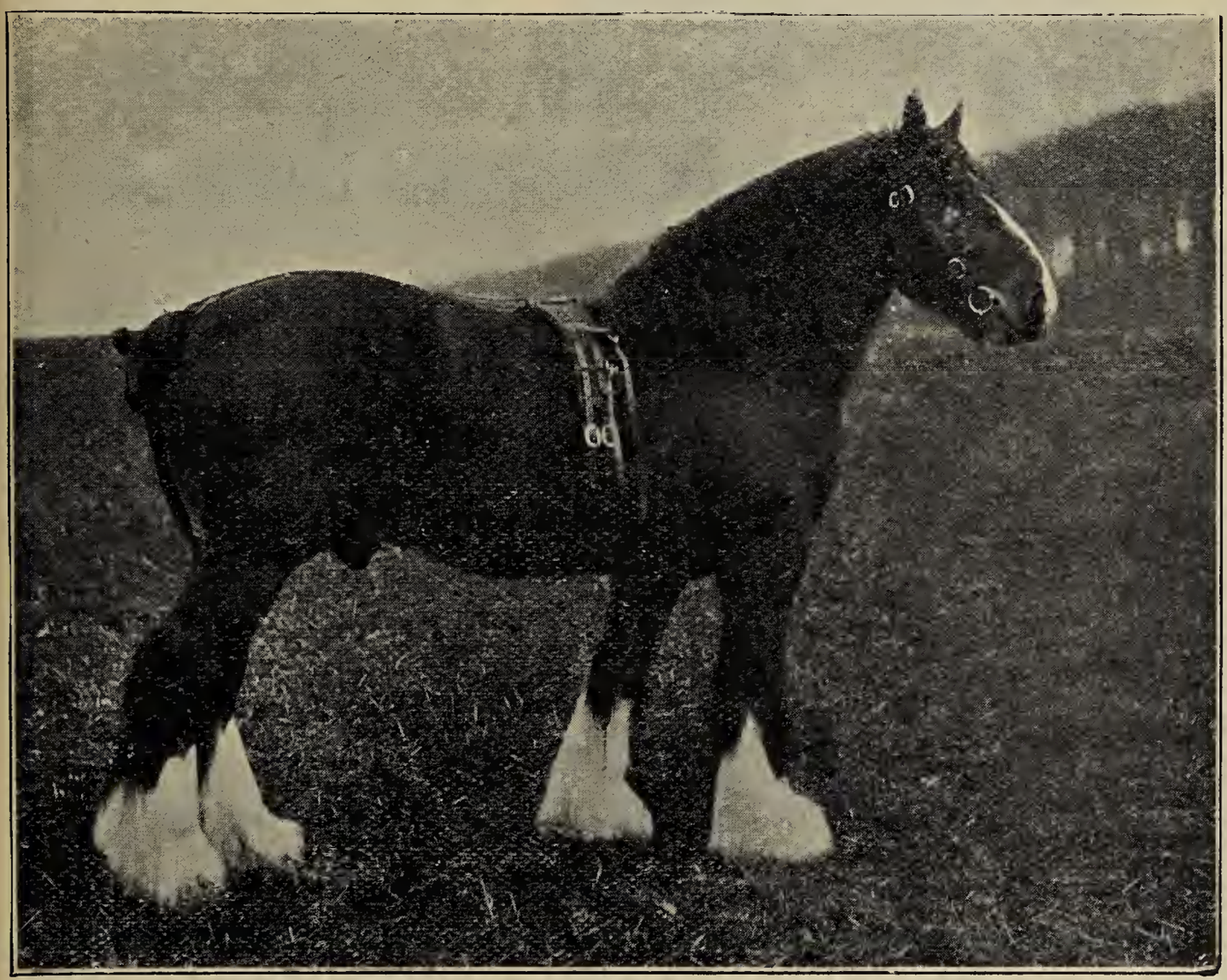

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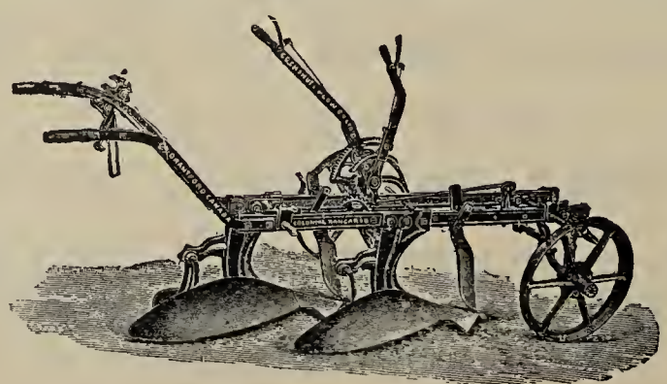

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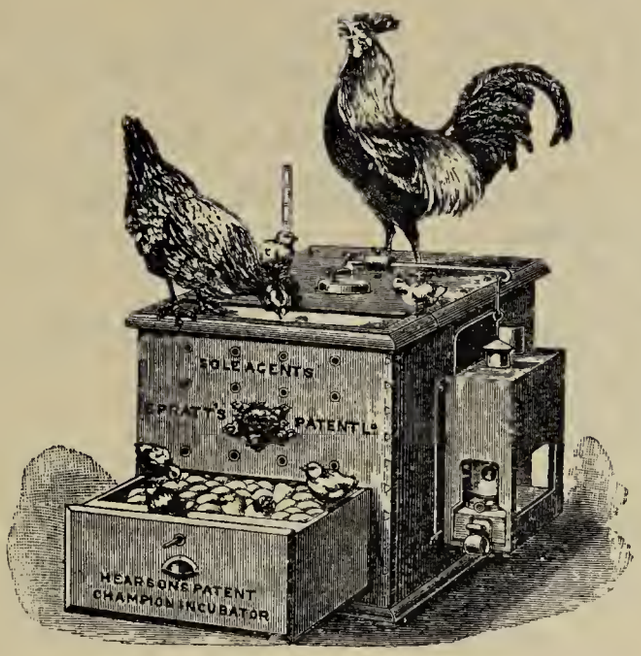

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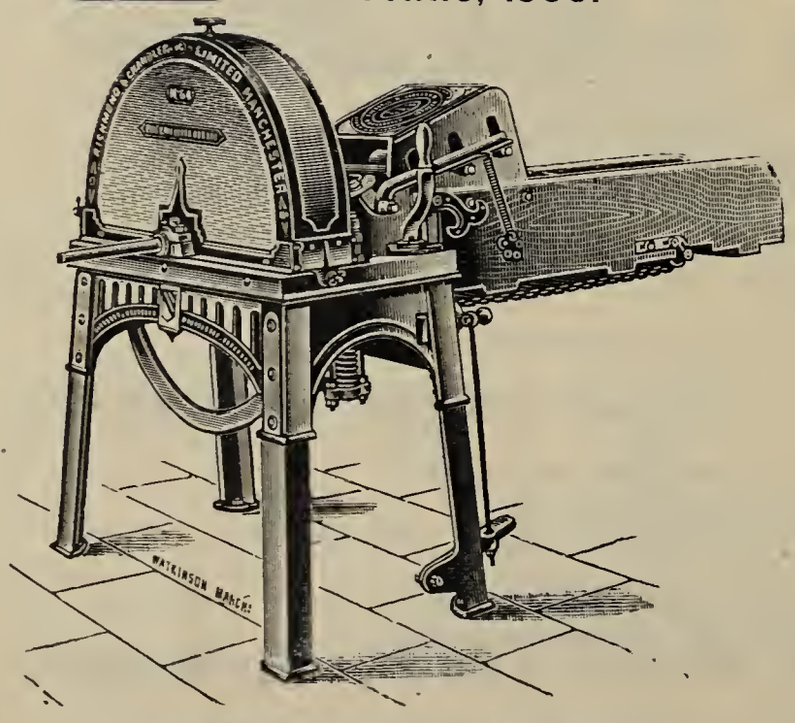

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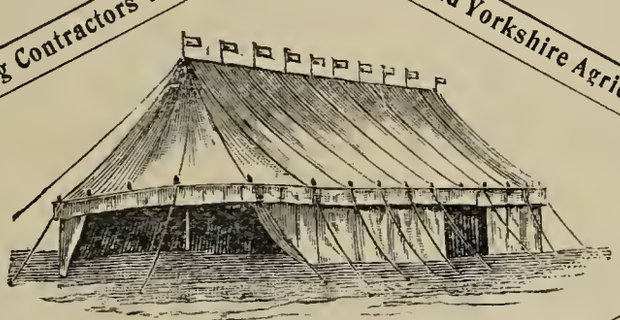

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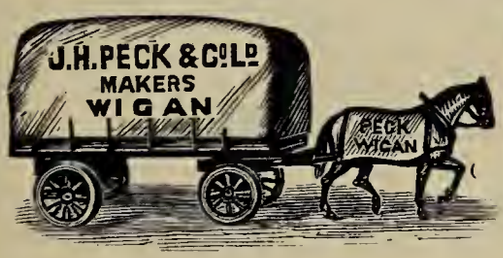

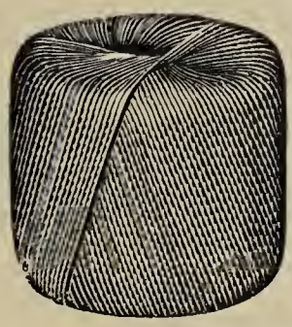

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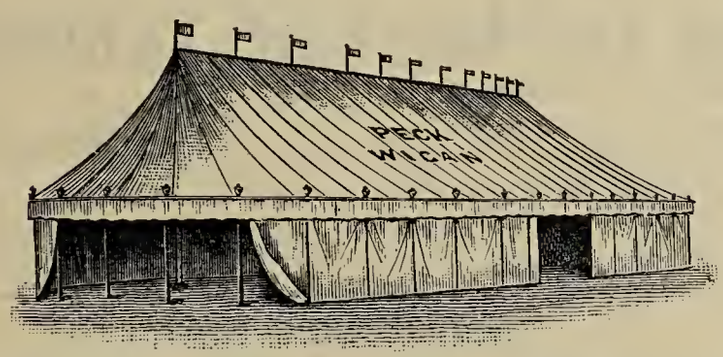

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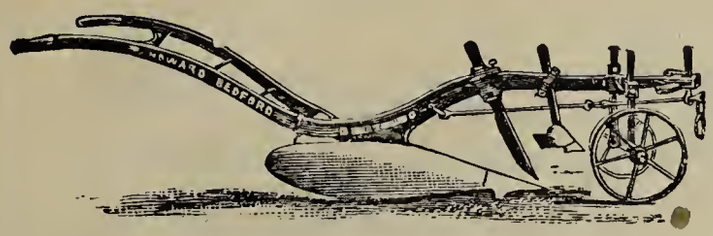

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S B, a very light pair-horse plough, weight 229 lbs.	4	12	6
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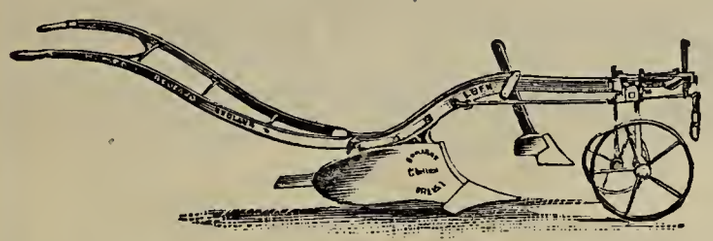

	£	s.	d.
D D X, with two wheels, and skim coulter, weight 200 lbs.	4	5	0
L B X, with two wheels, and skim coulter, weight 236 lbs.	5	0	0
LBFN, with two wheels, and skim coulter, weight 236 lbs.	5	0	0
LBT, with steel chisel bar share, weight 236 lbs.	5	0	0

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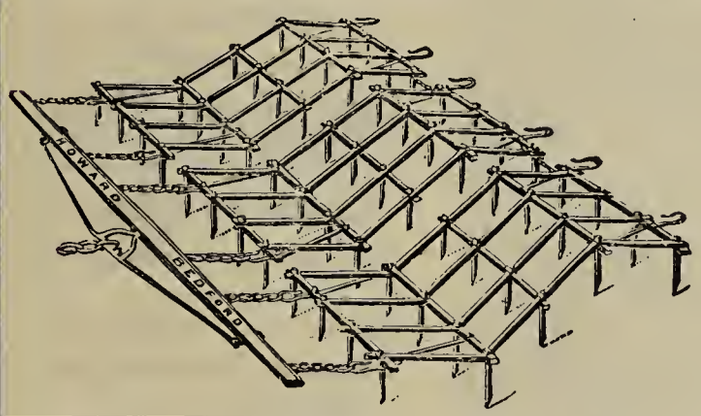

	£	s.	d.
No. 14, for one or two horses, 8½ ft. wide, weight 147 lbs.	3	7	6
No. 12, for two horses, 9½ ft. wide, weight 191 lbs..	3	15	0
No. 11, for two or three horses, 10 ft. wide, weight 247 lbs.	4	5	0

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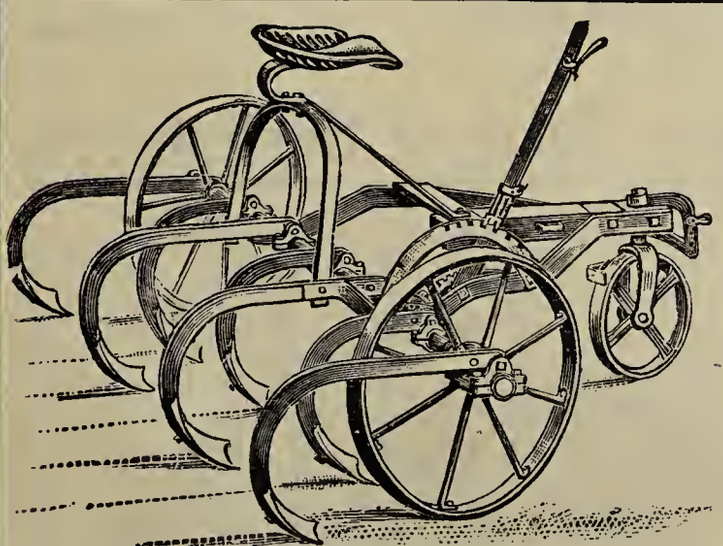

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No. 5, with seven tines, working width 4½ ft., weight 336 lbs.	8	0	0

Seed-box attached for broadcast sowing, Four Guineas.

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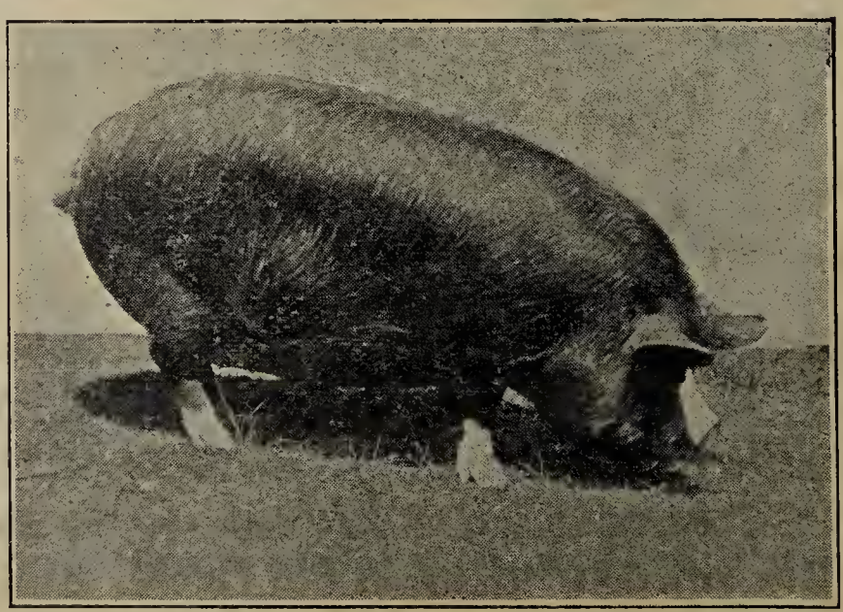

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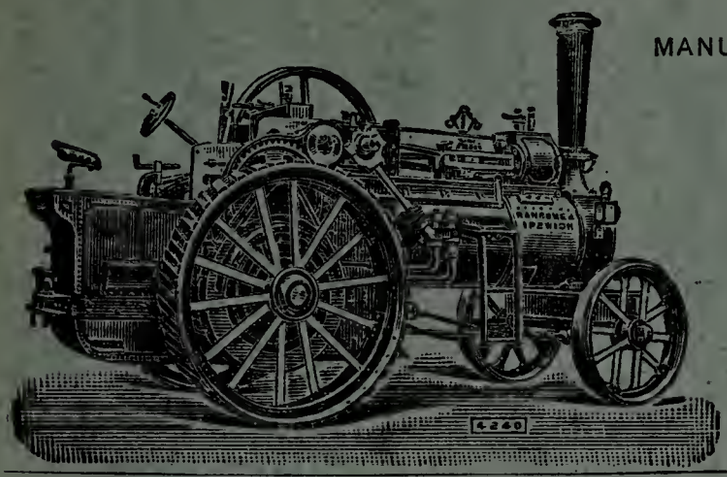

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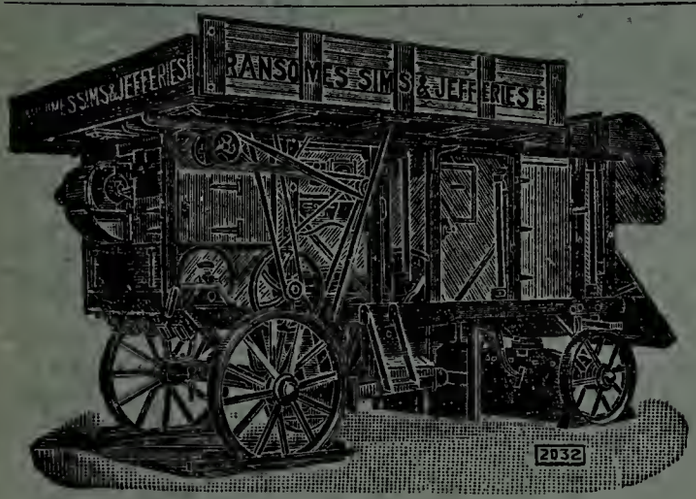

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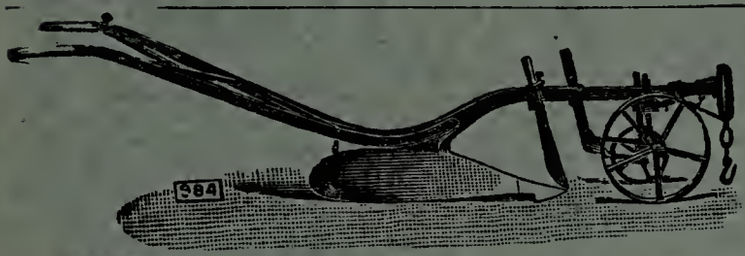

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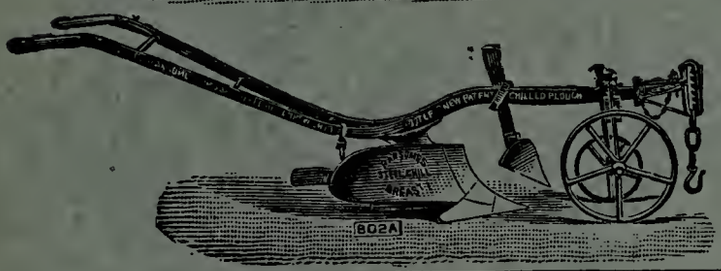

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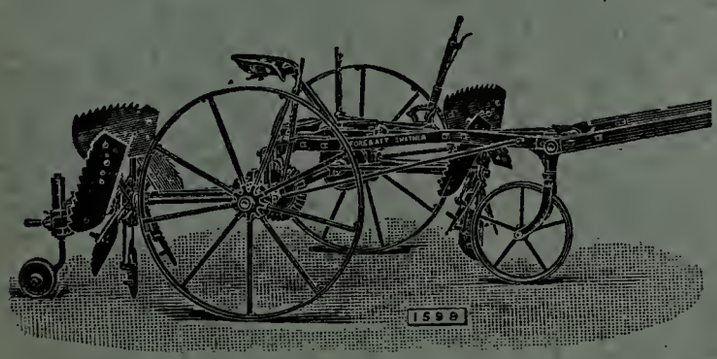

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